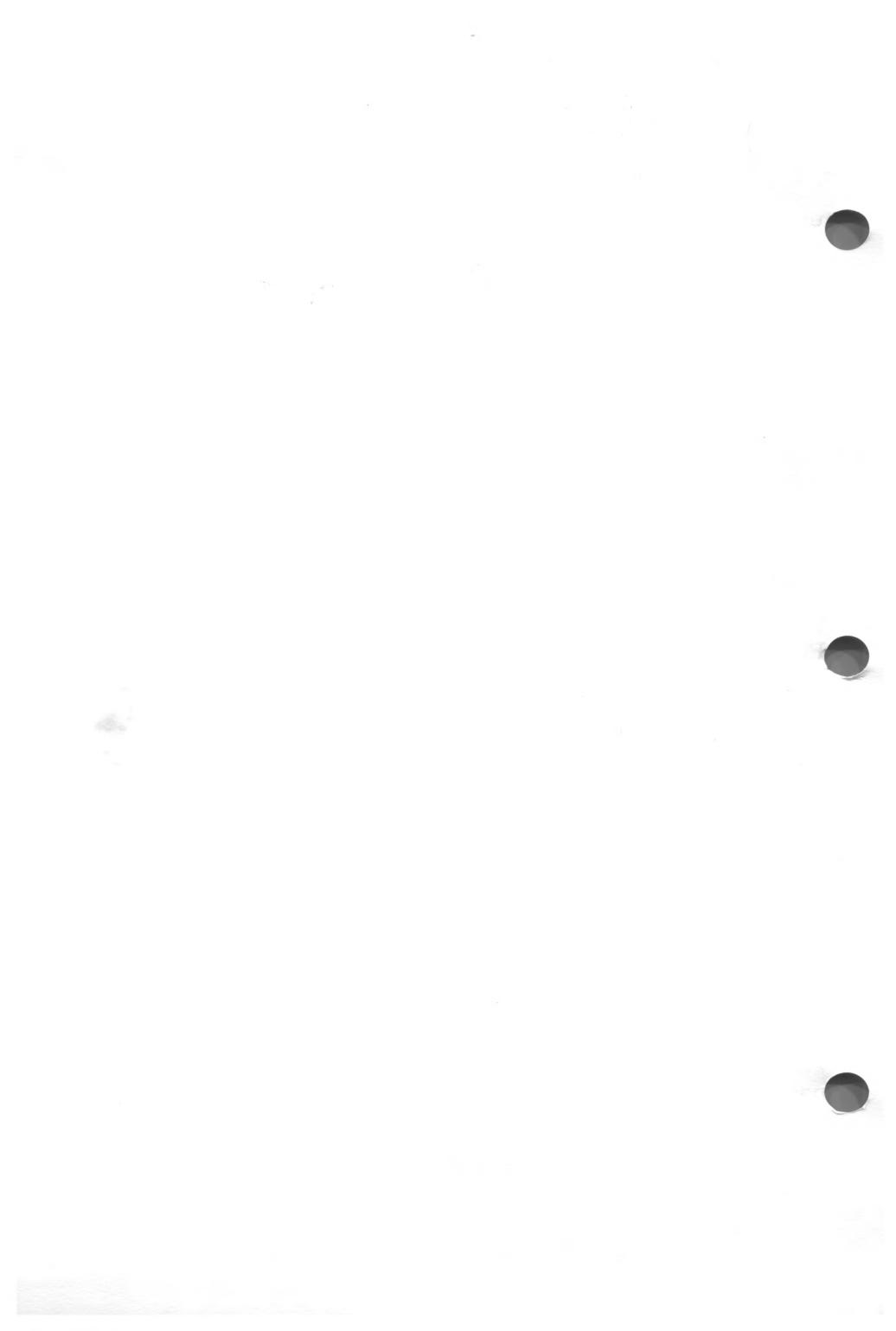




888 777 888

**INSTALLATION MANUAL
OPERATION MANUAL**



Installation manual for the
810 TURBO Double Density Conversion Board

Operation manual for the
810 TURBO (converted Atari 810 disk drive)

utilizing in whole or in part: OS/A+ v. 2.1 Operating System
OS/A+ v. 4.1 Operating System

The programs, disks, and section of this manual comprising OS/A+
are Copyright (c) 1982, 1983 by

OPTIMIZED SYSTEMS SOFTWARE, INC. (OSS) 408/446-3099
1173-D Saratoga-Sunnyvale Rd. San Jose, CA 95129

Reproduction of the OS/A+ programs, disks and manual by NCT is
authorized through contractual license with OSS.

The programs, disks, ROM code, and portions of this manual in
direct reference to the 810 TURBO as well as the trademarks
N/DOS, MACH 2XH DOS, 810T/4DDP, 810T, 810 TURBO and 810
TURBO Double Density Conversion Kit are Copyright (c) 1983 by

NEANDERTHAL COMPUTER THINGS (NCT) 714/770-0372
P.O. Box 16489 Irvine, CA 92713

The following hardware, firmware, software, and manual were
developed expressly for NCT:

810T BOARD designed by Charles L. Hosick

810T FIRMWARE and SOFTWARE written by James M. Hugard

810T MANUAL written by Tom Mannos

N/DOS and MACH 2XH DOS written by Hadley V. Stacey

810T/4DDP valFORTH DD PATCH written by Greg Beanton

Neanderthal Computer Things is the exclusive owner of all
proprietary, production and sale rights and copyrights of the 810T
BOARD, 810T FIRMWARE and SOFTWARE, N/DOS, MACH 2XH
DOS, 810T/4DDP valFORTH DD PATCH and this manual.

All rights reserved by both parties. Reproduction or translation
of any part of this work beyond that permitted by sections 107
and 108 of the United States Copyright Act without the
permission of the copyright owners is unlawful.

ATARI is a Trademark of Atari, Inc., Sunnyvale, CA

TEXT WIZARD is a Trademark of Datasoft, Inc., Northridge, CA

valFORTH is a Trademark of Valpar Int., Tucson, AZ

MONEY BACK GUARANTEE -

IN THE EVENT PURCHASER WISHES TO RETURN THE 810 TURBO DOUBLE DENSITY CONVERSION KIT FOR A REFUND, NEANDERTHAL COMPUTER THINGS WILL REFUND THE TOTAL PURCHASE PRICE PAID BY PURCHASER FOR THE 810 KIT UNDER THE FOLLOWING CONDITIONS: (Shipping and handling charges will not be refunded)

- A. The complete kit must be shipped at purchaser's expense and received by NCT no later than the return date specified on the purchaser's invoice.
- B. A copy of the purchaser's invoice must be included and all contents must be in their original condition. (disks, binder, etc.)
- C. The 810T Kit must be in resaleable condition. NCT will test the returned 810T board thoroughly and inspect the manual and software to determine if any repair, replacement, or conditioning is necessary to make the kit resaleable. If any expense is incurred to make the kit resaleable, that expense will be deducted from the refund.
- D. Refund payment will be forwarded to purchaser within five working days of receipt of returned kit and payment shall be by NCT company check or VISA/MC credit slip, based on method of purchase.

CAUTION: ANY REMOVAL, TEMPORARY OR PERMANENT, OF ANY COMPONENT SHIPPED INSTALLED IN THE 810T BOARD, WILL TOTALLY VOID THIS GUARANTEE. IF EITHER THE FLOPPY DISK CONTROLLER OR THE EPROM IS REMOVED FROM IT'S SOCKET, EVEN IF REPLACED, THIS GUARANTEE IS NULL AND VOID IN IT'S ENTIRETY.

THIS GUARANTEE APPLIES ONLY TO OWNER ON FILE AND CANNOT BE TRANSFERRED WITHOUT THE CONSENT OF NCT.

IMPORTANT NOTICE: THE FLOPPY DISK CONTROLLER CHIP IN THE 810T BOARD WILL BLOW SKY HIGH IF YOU ATTEMPT TO USE IT DIRECTLY ON THE 810 SIDE BOARD, OR THE DATA SEPARATOR BOARD OR ANY OTHER MODIFICATION IN YOUR 810. IT WILL PERMANENTLY RUIN THE CHIP! THERE IS NO REASON TO REMOVE IT, OR ANY OTHER COMPONENT, FROM THE 810T BOARD.

WARRANTEE -

THE 810T BOARD IS WARRANTED AGAINST DEFECTS FOR A PERIOD OF ONE YEAR AND NCT SOFTWARE IS WARRANTED FOR A PERIOD OF 30 DAYS FROM DATE OF DELIVERY. WITHIN THESE PERIODS, NEANDERTHAL COMPUTER THINGS (NCT) WILL REPAIR OR REPLACE DEFECTIVE MERCHANDISE WITHOUT CHARGE FOR PARTS AND LABOR. OWNER MUST BEAR ALL SHIPPING COSTS.

Should your 810T not function properly during this warranty period, please phone NCT prior to shipping it back for repair. Once we know the symptoms, we can tell you the next step for proper repair (We might need the whole disk drive).

Be apprised that your 810 disk drive, in it's original state, is equipped with a CPU chip that may not be compatable with the 810 TURBO board. This is the chip with the label (2) in the installation instructions. NCT DOES NOT WARRANT THIS OR ANY OTHER SIMILAR COMPONENT INCOMPATABILITY CONDITION AND WILL NOT BEAR THE COST OF CORRECTION. Page A-17 explains this condition and what should be done.

CAUTION: ANY REMOVAL, TEMPORARY OR PERMANENT, OF ANY COMPONENT SHIPPED INSTALLED IN THE 810T BOARD, WILL TOTALLY VOID THIS WARRANTY. IF EITHER THE FLOPPY DISK CONTROLLER OR THE EPROM IS REMOVED FROM IT'S SOCKET, EVEN IF REPLACED, THIS WARRANTY IS NULL AND VOID IN IT'S ENTIRETY.

NCT will attempt to upgrade BACKEMUP for duplication of new protected disks as they appear. Upgrades, as they are developed, will be made available at a nominal charge to owners on file.

THIS WARRANTY APPLIES ONLY TO OWNER ON FILE AND CANNOT BE TRANSFERRED WITHOUT THE CONSENT OF NCT.

THIS WARRANTY DOES NOT COVER MERCHANDISE SUBJECTED TO ABUSE OR MISUSE OR DAMAGE TO YOUR DISK DRIVE THROUGH IMPROPER INSTALLATION OR MISUSE.

THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS AND YOU MAY ALSO HAVE OTHER RIGHTS WHICH VARY FROM STATE TO STATE.

=====

TABLE OF CONTENTS

=====

A. INSTALLATION

- A-1 IMPORTANT NOTICE
- A-2 Work area and tools
- A-3 Removing top cover half
- A-4 Removing mechanism from cover
- A-5 Removing sideboard from mechanism
- A-6 Removing RFI shield from sideboard
- A-7 Removing data separator board from side board
- A-8 Removing IC chips from side board
- A-9 Unwrapping the 810T board
- A-10 Installing an IC chip
- A-11 Installing the 810T chips onto the sideboard
- A-12 Installing the 810T board onto the sideboard
- A-13 Cleaning the drive read/write head
- A-14 Reassembling the 810T disk drive
- A-15 Checking the 810T disk speed
- A-16 Adjusting the 810T disk speed

B. TROUBLE-SHOOTING

- B-1 GENERAL INFORMATION
- B-2 TWO MOST COMMON PROBLEMS
- B-3 THE OLD AGE PROBLEM
- B-4 GENERAL PROBLEMS
- B-5 A COUPLE OF POINTS

C. GENERAL INFORMATION

- C-1 THE VANILLA 810
- C-2 DO'S AND DON'T'S
- C-3 A COUPLE OF POINTS
- C-4 READING THE OPERATION SECTIONS
- C-6 CONFIGURING THE 810T AND/OR THE CONSOLE
- C-7 AN EXAMPLE (TEXT WIZARD)

D. N/DOS

- D-1 GENERATING N/DOS
- D-2 CREATING A SINGLE DENSITY N/DOS
- D-3 USING N/DOS
- D-8 ADVANCED N/DOS

===== TABLE OF CONTENTS =====

G. MACH 2XH DOS

G-1 GENERAL INFORMATION

H. 810T UTILITIES

H-1 GENERAL INFORMATION

I. BACKEMUP

I-1 CHANGING PARAMETERS

I-3 DUPLICATING A DISK

I-4 EXTENDED SKEW RECOVERY MODE

I-5 IF THE OPERATION ABORTS

J. PACKEMUP

J-1 PACKEMUP INFORMATION

J-2 PACKEMUP PROCEDURE

J-3 INITIALIZE A PACK DISK

J-4 MAP DISK TO PACK

J-5 PACK DISK

K. REVCHECK

K-1 CHECKING YOUR DISK SPEED

L. RECONFIGURE

L-1 RECONFIGURE INSTRUCTION OPTIONS

L-2 CHANGING THE 810T PARAMETERS

M. DIAGNOSTICS

M-1 RUNNING DIAGNOSTICS

O. OSS SECTION

O HOW THE 810T DIFFERS FROM OSS DOCUMENTATION

- OSS manual preface and table of contents

1 OSS DOCUMENTATION



A.**INSTALLATION****IMPORTANT NOTICE**

YOU **MUST** FOLLOW THE INSTALLATION INSTRUCTIONS TO THE ABSOLUTE LETTER. DON'T ATTEMPT ANY INSTALLATION UNTIL YOU'VE READ AND FULLY UNDERSTAND EACH INSTRUCTION. YOUR 810 TURBO BOARD WAS THOROUGHLY TESTED PRIOR TO SHIPMENT AND IS IN PERFECT WORKING CONDITION. THE MAJOR CAUSE OF MALFUNCTION AND/OR DAMAGED COMPONENTS IS THE IMPROPER INSTALLATION OF AN IC CHIP. IF YOU'RE NOT CAREFUL, IT IS EASY TO INSTALL ONE BACKWARDS AND/OR WITH ONE LEG OFFSET. WHEN THE DISK DRIVE IS BOOTTED, AN INCORRECTLY INSTALLED CHIP COULD DAMAGE THE CHIP ITSELF AND/OR ANOTHER COMPONENT IN THE DISK DRIVE. NCT WILL NOT BE RESPONSIBLE FOR, NOR WARRANTEE, ANY OF THESE DAMAGED CONDITIONS. IF YOUR 810 DISK DRIVE WORKED PROPERLY PRIOR TO INSTALLING THE 810 TURBO BOARD, IT WILL WORK PROPERLY AFTER CORRECT INSTALLATION.

IF YOUR DISK DRIVE WAS SENT BACK TO HAPPY COMPUTING AND MODIFIED FOR ONE OF THE ORIGINAL 'HAPPY' ENHANCEMENTS, IT MUST BE DE-MODIFIED BACK TO ITS' ORIGINAL FORM FOR 810 TURBO INSTALLATION.

IF IT HAS BEEN MODIFIED FOR ANY OTHER ROM OR PROM ENHANCEMENT, IT DOES NOT HAVE TO BE DE-MODIFIED.

**READ AND FOLLOW
THESE INSTRUCTIONS
VERY CAREFULLY**

It is suggested that you read through the entire installation section to get a feel for what has to be done. If you then decide you don't want to install the 810 TURBO yourself, call NCT and we will suggest someone in your area who can install it for you. The normal charge for installation is \$25.00 plus shipping.

=====
INSTALLATION
=====

Your 810T board is wrapped in foil as a shield against any X-rays it may have gone through during shipment. The board and separate IC chips are stuffed in shipping foam to prevent any legs bending or breaking. Be very careful when unwrapping the foil. Remove the foil as if you were unwrapping a time bomb - very carefully. If you insist upon seeing the 810T board before you're ready to install it, turn to page A-9 for instruction on unpacking. You could lift the wrong thing first. One of the chips is connected to the board only by a very thin wire. If that wire breaks, it just won't work. If you do unwrap it just to see it, wrap it back up again until you're ready to install it.

The dash after each number is for penciling in a check mark after you have completed the instruction.

1 ___ Locate a clean, well lighted area to work in, free from any condition that will cause static electricity. Don't work in a carpeted area. You've been zapped before with static electricity when you dragged your feet across carpet and touched something. Well, ground yourself one last time by touching something (refrigerator, another person) before sitting down to work. Be sure that you are static free before starting. If possible, wear rubber soled tennis shoes while working. THIS IS IMPORTANT!

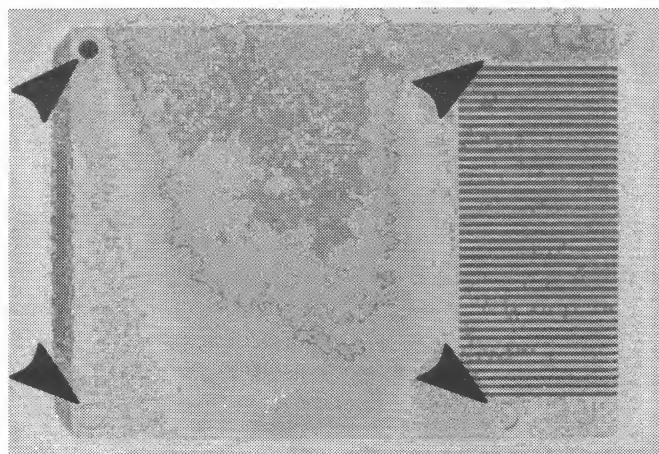
2 ___ Take your disk drive to the work area, leaving all hookup cables behind. **YOUR DISK DRIVE MUST BE COMPLETELY DISCONNECTED WHILE INSTALLING THE 810T BOARD.**

3 ___ You will need a few basic tools. **BE CERTAIN THAT NONE OF THESE TOOLS ARE MAGNETIC:**

- ___ Sharp fine point razor instrument such as an X-acto knife. A fine point thin blade pocket knife will also do.
- ___ Medium sized Phillips screwdriver (#1) with at least a 4 inch shank.
- ___ Narrow, metal fingernail file or thin shanked, slot screw driver or IC remover.
- ___ It's not essential, but a pair of tweezers, the longer the better, would help a lot.
- ___ Some kind of magnifying glass would help a lot, too.

810 TURBO
=====

INSTALLATION
=====



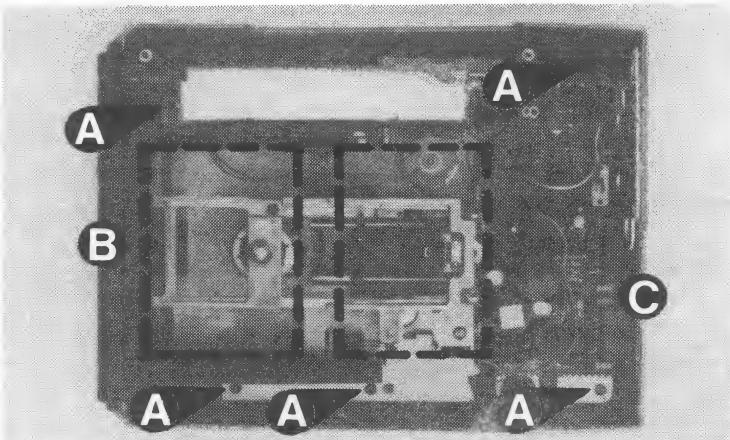
4 ____ On top of your 810 Disk Drive, there are four 1/2" circular discs. These plastic discs cover the access holes for the screws that hold the top half of the cover to the bottom half. They are simply heavy pressure sensitive tape and remove quite easily. Insert the point of your X-acto knife VERY CAREFULLY under the edge of each disc and pry them off. Take care not to cut into them. The best place to keep the removed discs is on the cover next to the access holes.

5 ____ Using the Phillips screwdriver, reach into the four access holes and start unscrewing. You'll have to go by feel, since you can't see the screws. You may have to place heavy down pressure to get them started. You'll know when they are completely loose by the slippage of the screw in the hole. Don't do anything to remove the screws. Just leave them in the access holes.

6 ____ When all four screws are loose, gently lift the top half of the cover straight straight up and off and set it aside. If any screw is not all the way loose, it will hold it's corner down. Just get in there and loosen it. The access holes are good places to leave the loose screws.

810 TURBO

INSTALLATION



The inside of your 810 will look basically like the above. It could also have an additional PC board right on top located at one of the two dotted rectangles. Unless otherwise specified, each of the following installation instructions apply to all of models of the 810 Disk Drive.

7 ___ Remove the 5 screws at locations (A) above. They are easily recognized by their larger heads. These screws hold the entire inner mechanism to the bottom cover half. If you have tweezers, retrieve the loose screws. If you can't retrieve them right now, don't worry about it. Just let them lay there.

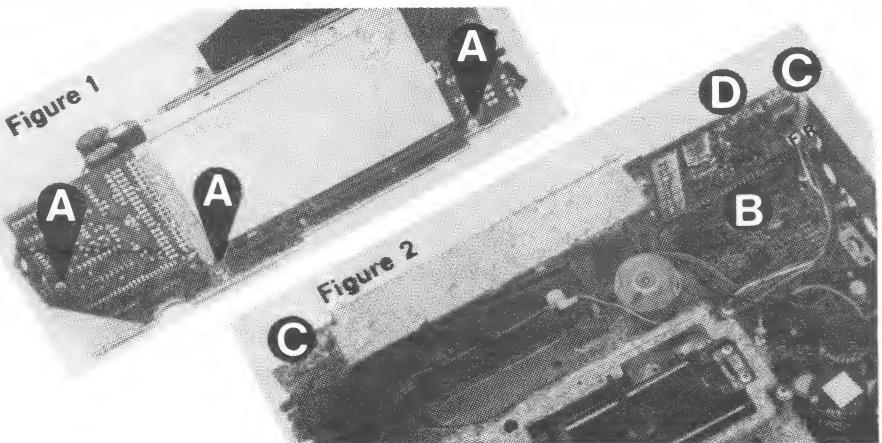
8 ___ So you'll remember how to re-install it, notice how the extending sides of the front plate fit into the parallel slots on the side of the lower cover opening.

9 ___ With one hand, take hold of the front of the drive mechanism and the loose front plate (B). With the other hand, take hold of the rear panel of the lower cover half, just over the connector cable jacks (C).

10 ___ Bend the back panel out SLIGHTLY until you can lift the entire mechanism out of the lower cover half.

11 ___ Set aside the front plate, the lower cover half, and the 5 loose screws. Keep them separate from any other loose screws.

INSTALLATION



12 ____ Remove the 3 screws (A) shown in Figure 1 above. Set them aside separate from the other loose screws.

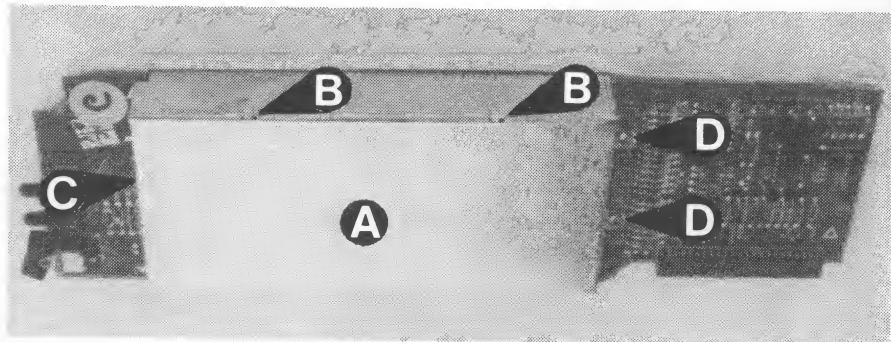
13 ____ Stick the provided labels with the F (Front) and the R (Rear) on top of the two four pin connectors, (F) and (R), as shown in Figure 2. Once the labels are on securely, disconnect the connectors from the side board by **VERY GENTLY** rocking them up and down (vertically) while applying slight pull pressure.

14 ____ There is a large 23 pin connector in the rear lower corner of the side board (B) which connects the side board to the floor board. The side board has to be removed by disconnecting this connector. The best way to do it is to take the side board by each top corner (C) and rock the board slightly up and down, perpendicular to the floor board. The female connector on the side board will crawl off its male counterpart on the floor board. **DO THIS GENTLY WITH VERY, VERY SHORT ROCKING MOTIONS.** If you rush this and rock too hard, you could crack the solder joints under the floor board of the male connector. Be patient and gentle. This is easier to do if someone else is firmly holding down the rest of the mechanism. Be extremely careful and don't bend the four transistors (D) sticking out from the rear top corner of the board.

15 ____ Set the rest of the mechanism to the side. You will be working on just the side board from here on.

810 TURBO

INSTALLATION



That shiny tin box you see (A) is the RFI shield. As you remove the shield box, remember it's structure for easy re-assembly. Three tabs have to be straightened for removal. They must be bent until they are on the same plane as the side they're cut from. DON'T bend them any more times than you have to. They break off easily.

16 ____ Gently bend the two tabs at the top of the shield box (B) 90 degrees until they are perpendicular to the side board.

17 ____ The third tab is at location (C) on the other side (outside) of the board. Gently bend it 90 degrees until it is perpendicular to the side board.

18 ____ Remove the two screws located at (D). These are screwed into the bar that helps hold the side board to the mechanism floor.

19 ____ Tilt the part of the shield box located on the other side of the board (outside) away from the side board until you can slide it free from the two tabs.

20 ____ Pull the inside piece of the shield box straight away from the side board.

21 ____ Place the bar, 2 screws and 2 shield box pieces off to the side, separate from any other loose screws.

INSTALLATION

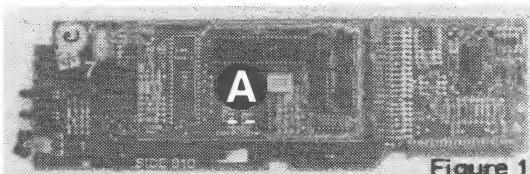
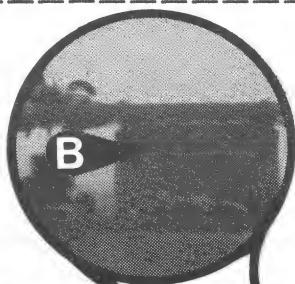
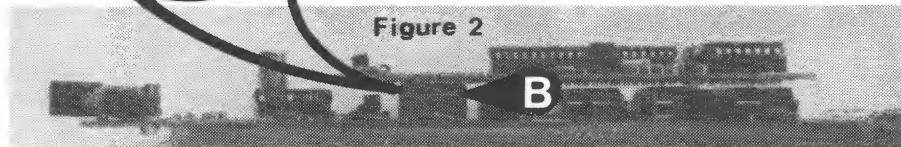


Figure 1

Figure 2



READ THIS PAGE EVEN IF YOUR SIDE BOARD DOESN'T LOOK LIKE FIGURE 1 ABOVE.

If your side board has a data separator piggy-back board (A), it must be removed. The following method of removing this board also applies to removing any IC chip (the little rectangular components with a million legs coming out of them).

FOLLOW THIS METHOD VERY CAREFULLY.

22 ___ View the board from the long edge as in Figure 2, then insert the fingernail file slightly, about 1/4", into the slit (B) just above the socket. If you're using the slot screw driver, just insert it as far as it will go without any pressure.

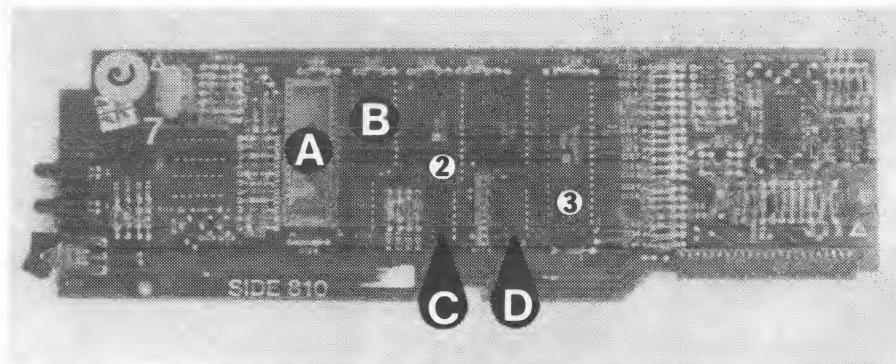
23 ___ Twist the file or screwdriver ever so slightly until the top piece JUST STARTS TO LIFT from the socket. Use whatever pressure is necessary, but be gentle. Lifting too much with each motion could bend the legs of the connector or IC chip.

24 ___ Do the same thing on the other end of the socket and keep alternating ends until the top piece is free.

25 ___ You won't need the data separator board anymore, but you should wrap it in foil and keep it in case you ever need your 810 serviced. Atari service centers don't like altered 810's.

810 TURBO

INSTALLATION



If you removed your data separator piggy-back board, your side board now looks like the above. The chip that would normally be in location (A) was on your data separator board.

If you didn't have the data separator board to start, there is a chip in location (A) that must be removed.

26 ____ Using the same method as just explained, remove the chip at location (A), if it's there, and the chips at locations (B), (C) and (D). You won't need these chips anymore, but we suggest you wrap them and save them for the same reason as mentioned. Wrap them right now so they don't get mixed up with any you do need.

27 ____ Stick the provided matching labels on the IC chips (2) and (3) as shown. Be sure that the numbers on the stickers read right side up and are placed on the bottom end of the chip just as shown in the illustration. THIS IS EXTREMELY IMPORTANT! These IC chips are going to be re-installed in the 810 TURBO board. They **MUST** be installed only one way and this will identify them so that the installation instruction is easy to follow.

28 ____ **VERY CAREFULLY**, remove the two chips you just stuck labels upon, (2) and (3), and keep them in your work area in a safe, static-free place. **TAKE EVERY PRECAUTION TO NOT BEND THE LEGS ON ANY CHIPS DURING REMOVAL AND HANDLING!**

As you remove each chip, check the socket holes. A tight chip has a tendency to 'spring' the socket hole tabs up. You'll see the difference in the holes if any tabs are sprung. Just push them back into place carefully with your fingernail or a screwdriver.

INSTALLATION

It is important that you unwrap the 810T board properly. If you try to remove the wrong piece of protective foam first, you may put pressure on the thin wire holding the small IC chip and break it, or drop the board and bend things.

29 ____ Carefully unwrap the foil from the 810T board. Don't put any unnecessary pressure on anything while you're doing this.

30 ____ Position the wrapped 810T board with the correct side up (see label under rubber bands). Remove the rubber bands holding everything together and remove the top piece of foam with the label on it.

31 ____ Everything will come out of the bottom layer of foam pretty easily. With thumb and forefinger, just take the ends of the socket, with the label (A), and lift it out of the foam.

32 ____ Do the same thing with the lone, isolated chip with the label (4) on it (no wire connection), and lift it out of the foam.

33 ____ The IC chip with the label (5) on it that is attached to the 810T board by the thin wire has to come out of the foam before the board comes out. Just lift it out as you did the other IC chip. DON'T PULL IT BY THE WIRE AND DON'T PUT ANY PRESSURE ON THE WIRE! Once it's out of the foam, it will float by the wire okay. You don't have to support it.

34 ____ Now take the 810T board by the long sides and pull it out of the foam. HANDLE ALL OF THIS WITH EXTREME CARE. You just don't want to break that wire.

You can now throw the foam and foil away or use them to wrap the chips you are going to save.

810 TURBO

INSTALLATION

MAKE SURE YOU UNDERSTAND THE FOLLOWING PROCEDURE FOR INSTALLING AN IC CHIP INTO ITS' SOCKET. THE SAME PROCEDURE APPLIES WHEN IT'S TIME TO INSTALL THE 810T BOARD ONTO THE SIDE BOARD. READ IT CAREFULLY AND REFER TO IT IF NECESSARY AS YOU GO ALONG.

If you've never done this before, It is suggested you practice with the chips you removed from positions (C) and (D) on page A-8. Practice putting them back in, bending the legs, removing them, etc. If you break them, they're pretty easily replaced at not too great an expense. (If you ever need them again)

A. Place the IC chip on top of the socket gently and double check that the legs are not offset with the socket holes. This is where the magnifying glass would help.

B. Do step A a second time then apply a little pressure to see if the chip legs will start to go into the socket holes okay.

C. If the two rows of legs are spread wider than the two rows of socket holes, bend one row in slightly. This is done by pressuring the whole row of legs gently against a table top or flat surface. Don't bend one leg at a time. Be sure to bend at the base of the legs and not at the tips.

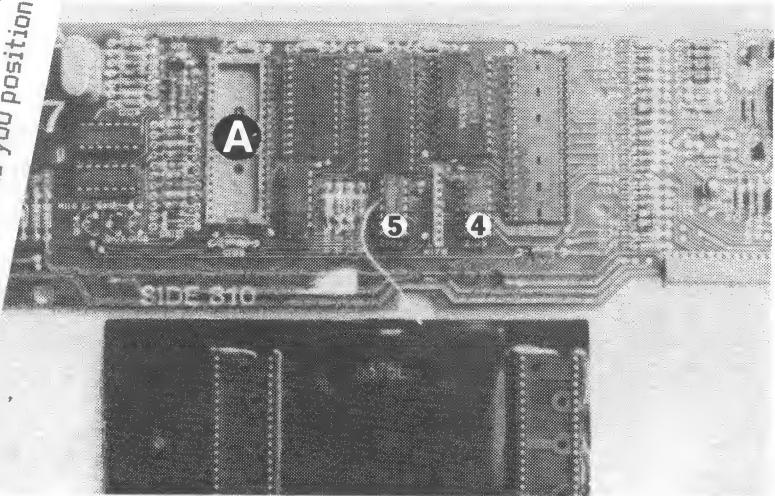
D. When positioned properly, press the chip in slowly and firmly by squeezing it in with your fingers and thumbs. DO NOT USE PLIERS OR ANY OTHER TOOL FOR THIS. The only exception to this is if you use an IC installation tool.

E. As an alternative to squeezing the chip in with your hands, you can place the side board on a towel on a flat surface and just press the chip in with your thumbs. You can also do this when it's time to install the 810T board. There isn't anything under the side board that can bend or break so you can put all the pressure on it you need for complete and proper seating.

F. YOU CAN'T BE TOO CAREFUL!

INSTALLATION

NOTICE Your 810T board does not look like this. It isn't potted. You can recognize the correct positioning by the wire coming out of the TOP of the board as you position it.



36 ____ Position the side board as shown above, but don't position the 810T board as shown yet.

37 ____ If the socket at position (A) in your side board is black, you must use the socket extender with the label (A) that came with your kit. If your socket isn't black, you don't need the extender. If you need it, install it now. It doesn't matter which end of the socket extender goes into which end of the socket on your board. Everything from here on DOES matter.

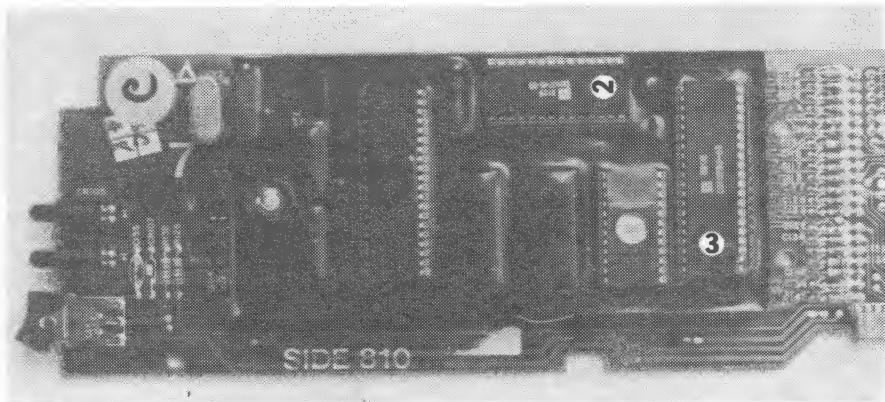
37 ____ Install the IC chip with the label (4) into the socket at position (4). Make sure the label is at the same end of the chip as shown above and that the number 4 reads as shown, right side up.

37 ____ Lay the 810T board upside down on the table against the side board as shown above. You can tell it's upside down by all the legs sticking out of it and, if it's positioned correctly, the wire is coming out of the edge furthest from you and the serial number is right side up and readable.

38 ____ Install the floating chip at the end of the wire into the socket at position (5). Make sure the label is at the same end of the chip as shown above and that the number 5 reads as shown, right side up.

810 TURBO

INSTALLATION



39 ___ Roll the 810T board over and forward and position it on it's receiving sockets. DON'T PUT ANY STRAIN ON THE CONNECTING WIRE WHEN DOING THIS. The 810T board should look like the above when positioned.

40 ___ Double check that the 810T board is positioned properly on the sockets. BE CERTAIN THAT ALL OF THE LEGS ARE POSITIONED OVER THEIR CORRESPONDING SOCKET HOLES AND THAT THEY ARE NOT OFFSET FROM THE SOCKET HOLES.

41 ___ Apply slight pressure on one connector to start the installation, then the other connector. Keep alternating pressure on the connectors until the 810T is completely seated in the sockets. Don't exert any pressure on any part of the 810T board except right over the connectors. Make sure the connectors are all the way in an can go no more. Don't use any tools for this.

42 ___ Install the IC chips you took out of the side board and put label (2) and (3) on into the sockets located at (2) and (3) respectively. DOUBLE CHECK THAT THE LABELS ARE POSITIONED AND READ EXACTLY AS SHOWN IN THE ILLUSTRATION ABOVE.

Your 810T board installation on the side board is now complete. Under no circumstances are you to alter the two small components on the left of the board. They are preset for proper operation. DON'T TOUCH THEM!

810 TURBO

INSTALLATION

When your 810 TURBO is working, double density read and write is far more sensitive than single density. You're putting twice as much data on the disk and the mechanics of this are simply more intricate and more demanding.

Therefore, the need for a clean read/write head in the drive is more critical. You **MUST** have a clean head when using the 810 TURBO. If you don't, it may not function properly. It won't hurt anything - by that, nothing will be damaged - it just may not function properly.

If you think the head needs cleaning, now is the best time to do it. It's easier with the drive disassembled.

The absolute best way is with a special head cleaning solution for tape recorders and a special cleaning swab for electronic parts. Radio Shack, or a similar type electronics store, is a good source for both of these items.

Second best way is with ISOPROPYL or DENATURED alcohol and a lint free soft cloth.

Whatever you do, **DO NOT USE STANDARD RUBBING ALCOHOL AND DO NOT USE Q-TIPS**. One of the solutions in standard rubbing alcohol can leave a film on the head and the glue used in the drug store Q-Tip type swabs can really gum up the works.

Using the proper materials, thoroughly swab down both parts of the read/write head, upper and lower. The lower head is the read/write head, the upper is the pressure head. Clean them both thoroughly, particularly the lower one.

If you own a **WET** head cleaning kit (disk), you may also use that after your drive is assembled. If you own a **DRY** head cleaning kit (disk), throw it away as fast as you can. It's abrasive and wears down the head.

INSTALLATION

Now you must reassemble your disk drive by reversing the instructions you've read so far. The following instructions are a quick check list for each step with reference to the disassembly instruction numbers. **READ EACH INSTRUCTION ON THIS PAGE COMPLETELY BEFORE YOU REFER TO THE DISASSEMBLY INSTRUCTIONS.**

43 ____ (#20-#16) If you had a data separator on your side board, there is a half sphere rubber bumper pasted on the inside of one of the RFI shield box pieces. Pry it off with the slot screw driver and throw it away. Reassemble the RFI shield box onto the side board. Remember to bend the tabs back into holding position. Bend them just once. When you screw the two screws onto the holding bar, remember the short leg of the bar sticks out (away) from the side board. If the shield box bows a bit and is not quite flush to the side board, don't worry about it. The extra thickness of the 810T board may cause this. It'll still work fine.

44 ____ (#14-#12) Position the large 23 pin female connector on the side board properly over the male connector on the floor board and connect them using a straight down pressure on the top edge of the side board. Reconnect the two 4 pin connectors on the upper rear of the side board (F) and (R) in the same order as the diagram, and screw the side board in place on the floor pan with the 3 screws.

45 ____ (#10-#7) Place the front plate against the front of the mechanism and set the mechanism in place in the lower cover half. Make sure the edges on the sides of the front plate are in the proper slots on the sides of the lower cover opening. Screw in the 5 screws that hold the mechanism to the lower cover half. Here's where you really need the long tweezers.

DON'T put the top cover half on yet.

INSTALLATION

FROM HERE ON YOUR DISK DRIVE WILL BE CALLED THE '810T'. IT IS NO LONGER JUST A MUNDANE 810 DISK DRIVE. IF YOUR 810T DOESN'T FUNCTION AS STATED FROM HERE ON, SHUT EVERYTHING DOWN AND CHECK EACH STEP OF THE INSTALLATION. IF YOU'RE SURE IT'S INSTALLED CORRECTLY AND IT STILL DOESN'T WORK, CALL NCT.

46 ____ Take your 810T back to the computer area. Make sure your entire system is down and the switch on the 810T is off (lower half of the switch in, upper half out). Hook up all the connector cables and power supplies to make your system operational.

47 ____ Turn on the 810T. Remember how your old 810 disk drive used to take forever for the motor light to go off? Notice how fast it happens now. (If your CPU is off when you turn the 810T on, the duration is very short. If the CPU is on before you turn the 810T on, it will take as long as it used to.)

48 ____ Insert the NCT 810T/UTILITY disk into the 810T, close the door, and turn on the computer consul.

49 ____ When the menu comes on the screen, type in RPM and hit RETURN. In a few seconds, you'll be seeing just how many Revolutions Per Minute the disk is turning in the 810T.

There isn't an 810 disk drive in the world that spins at an absolute constant speed all the time. They all vary within a couple of revolutions during operation.

If your 810T is operating between the two gaps in the gauge bar (on each side of the center dot) and the RPM's show from 286 to 290, your 810T is operating at correct speed. 288 RPM is perfect and 2 RPM's each way is quite alright. You may now replace your top cover half (#6-#4) and turn to the second page from here (B-1) for the OPERATION section.

If your 810T speed needs adjustment or if you just want to learn how to adjust the speed for future reference, turn to the next page (A-16).

810 TURBO

INSTALLATION

Figure 1

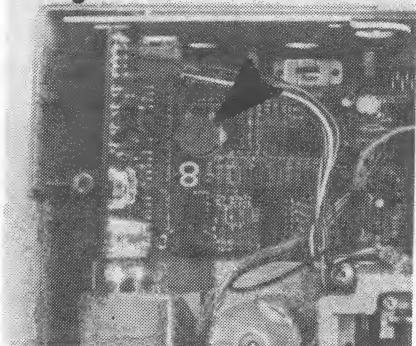
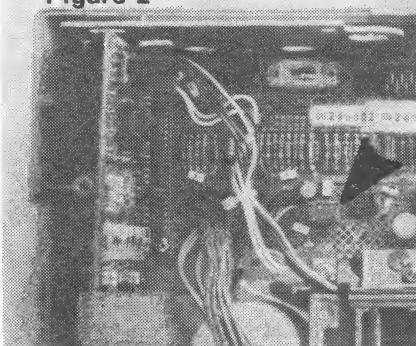


Figure 2



Once you have learned how to adjust the speed on you 810T, you should make a habit of checking the speed at least once a week with RPM and adjusting if necessary.

Depending on which model disk drive you have, the adjusting potentiometer is in one of the locations above.

If your 810T has a potentiometer in the location shown in Figure 1, the adjustment is very sensitive. When you adjust the pot, turn it with exceptionally small movements. Each fraction of a turn can vary the speed by many revolutions.

If the pot is located as in Figure 2, the adjustment is not sensitive at all and you may have to adjust the pot by half a turn to adjust the disk speed by a single revolution. You'll need a very small screwdriver for this.

In both cases, turning the pot counter-clockwise increases the disk speed, clockwise decreases it. While RPM is still running, keep adjusting the pot until the gauge settles on the center line and the RPMs show the accepted range of 286 to 290 RPMs. If you can get it to zero right on 288 RPMs, that is best.

Once you've adjusted the speed, let it run for a couple of minutes. It's always best to test the 810T when it's warmed up a bit.

=====

B. TROUBLE-SHOOTING

=====

GENERAL INFORMATION...

IMPORTANT: BE CERTAIN TO DO YOUR TESTING OF THE 810T WITH A DISK CERTIFIED FOR DOUBLE DENSITY!

THIS SECTION IS NOT MEANT TO BE A COMPLETE SERVICE MANUAL FOR YOUR DISK DRIVE. IT HAS TO DO WITH A FEW PROBLEMS YOU MIGHT ENCOUNTER WITH YOUR 810T CONVERSION.

If the 810T board isn't PROPERLY installed, a number of things can happen that can't be recovered by any instruction in this section.

Once properly installed, there are a few conditions that may prevent proper operation, particularly in double density. These conditions are explained on pages B-2 and B-3. Read these pages thoroughly before referencing this section for any particular problem.

Individual problems start on page B-4. The first four problems covered (A-D) would happen prior to your attempt to run the REVCHECK program or any other load.

Any following problems (E-on) are general ones that might occur at any time.

Any problem shown in this section can occur at any time and should be referenced if necessary.

The problems are listed in the expected order of occurrence and the reasons for each problem are listed in a sequence of most likely reason for the problem (Reason #1 is more likely to be the cause than reason #2, etc.). Try the solution to reason #1 before you try the solution to reason #2, etc.

Problems are alpha, underlines.

Reasons are numbered, standard print, not underlined.

Solutions are condensed print, in brackets.

IF YOU'VE TRIED WHAT MAY APPLY IN THIS SECTION TO ANY PARTICULAR PROBLEM AND IT STILL DOESN'T WORK, CALL NCT AT 714/770-0372.

TROUBLE-SHOOTING

TWO MOST COMMON PROBLEMS...

If your 810 disk drive performed properly prior to installing the 810T board, it will work after proper installation, with two possible exceptions. These two exceptions don't crop up that often but they are the two most common ones.

1. INCOMPATABLE CPU CHIP - Over 90% of the calls received by us about an 810T not working are due to an incompatable CPU chip. This is the chip with the label (2) that came with your disk drive and is now on the 810T board (page A-12). Find a local source for another one. It's a 6507 CPU chip and make sure the brand is MOS TECHNOLOGY or ROCKWELL (DO NOT get a SYNERTEK). This chip will cost you from \$10 to \$15. It's suggested that you make arrangements with the dealer to take two of them home and be able to return one or both if the situation isn't corrected.

BE CERTAIN IT IS INSTALLED CORRECTLY - pay very strict attention to the little half circle indentation on one end of the chip and be certain the chip is installed with the indentation on the same end as the indentation on the socket.

If you can't find one locally, NCT has them available for \$12, including shipping. If you order from us, it will have been tested for the 810T, it will be pre-labeled with the (2) for installation and we will take it back if you don't need it.

2. OXIDIZED CONNECTIONS - The 23 pin connector (B, page A-5) and the two 4 pin connectors located at the top rear of the side board (F and R, page A-5) should be cleaned before you reassemble your disk drive.

The best way to clean them is with a common eraser. The best eraser to use is the triangular, pyramidal slip-on that you slip onto the end of a pencil. Next best is a Pink Pearl or the standard eraser that comes on the end of a pencil. The softer the eraser, the better. Just be sure it's clean when you start.

Just erase the oxidation from each of the male contact points. **CLEAN THEM WELL - ERASE LIKE CRAZY!** Be sure to blow away all the loose eraser bits. If you really want to be thorough, pick up some silicone based TUNER CLEANER (pressurized can) from Radio Shack and squirt some in the female connectors.

=====

TROUBLE-SHOOTING

=====

THE OLD AGE PROBLEM...

If you've replaced the CPU chip, cleaned the connectors, cleaned the heads and made sure the speed is at 288 RPM's, and you still have trouble, especially with double density, it may be in the area of your read/write head. Old age (over 1 year old) and/or heavy usage can cause this.

In that area there are a couple of possible conditions that will cause problems:

1. SPRING TENSION IS OFF - It could be too loose. This is the little single wire spring pressing down on the pressure pad when you close the drive door. One sure way of knowing if the tension is loose is if the little slotted dowel that holds the pressure pad in the pressure pad arm is jiggling or turning in its' housing while it's reading or writing to a disk. This is terminal loose. Another way of testing is if a disk doesn't format, try it a few more times and put a bit of pressure on the head with your finger while it's formatting. Keep increasing the pressure with each attempt. Just don't get brutal. If it eventually formats, you've got bad spring tension. This is caused by either the spring having lost its' tension or a worn pressure pad. Try replacing the pressure pad first. It's a relatively simple job and the part will run you about \$5. We don't recommend that you try bending the spring stronger. This should be done by a service center with instruments to measure the proper tension.

2. READ/WRITE HEAD MISALIGNED OR WORN - Not too likely, yet possible. Even if it worked okay in single density, remember that double density is more critical. There really isn't any way to test for this at home or to fix it at home. Just hock the farm and head for a service center.

There are a couple of other conditions caused by time and wear but they don't crop up that often so we won't cover them here.

810 TURBO

TROUBLE-SHOOTING

GENERAL PROBLEMS...

You've installed the 810T, assembled your system as per instruction #46, page A-15 and you turn on the 810T, ready to run REVCHECK:

A. NOTHING HAPPENS

1. Power cord not connected to disk drive.
[Connect power cord to disk drive.]
2. Side board connector is one pin off.
[Remove side board from floor board and re-connect properly.]

B. POWER LIGHT ON, BUSY LIGHT WON'T TURN OFF

1. TURBO board installed one leg off.
[Re-install TURBO board correctly.]
2. Bent pin on CPU chip (2) or PIA chip (3).
[Remove CPU (2) or PIA (3), carefully straighten pin, re-install.]
3. Bent pin on one of the 810T board connectors.
[Try to straighten pin (doubtful) and reinstall.]
[If pin breaks, send board to NCT for repair.]
4. Incompatable CPU chip.
[Replace CPU chip.]

C. DRIVE POWERS UP OKAY, NO QUACK

(Stepper motor didn't home the head to track 0)

1. The (R) connector (page A-8) isn't connected.
[Connect the (R) connector.]
2. The (R) connector is connected one leg off.
[Remove (R) connector and re-connect properly.]
3. Incompatable CPU chip.
[Replace CPU chip. See page B-2.]

D. TURNED CONSOLE ON, NO DISK DRIVE ACTION

1. Disk drive not configured to Drive 1.
[Configure back of disk drive to Drive 1.]
2. Disk drive not connected to console or interface.
[Connect drive to console or interface.]
3. Pin bent somewhere.
[Check for bent pin on CPU (2), PIA (3) or 810T board. Same solutions as B.1 and B.2. A bent pin here may not necessarily have caused problem B. It could be a different pin.]

=====

TROUBLE-SHOOTING

=====

GENERAL PROBLEMS... (cont)

- E. TURN CONSOLE ON, BUSY LIGHT WON'T TURN OFF**
 - 1. TURBO board installed one leg off.
[Re-install TURBO board correctly.]
 - 2. Incompatable CPU chip.
[Replace CPU chip. See page A-17]
- F. SPEED SWING VARIANCE OVER 3 RPMs DURING OPERATION**
 - 1. Oxidized connectors and/or loose transistors.
[Call NCT for solution.]
 - 2. Bad POT, speed controller electronics component, or motor.
[Call your local Atari service center, try to pinpoint which is bad by symptoms over the phone, purchase the right part and repair it or take the whole thing to the service center for repair.]
- G. WON'T FORMAT DOUBLE DENSITY**
 - 1. 810T or console configured wrong.
[Reconfigure 810T and/or console.]
 - 2. Disk speed off.
[Adjust disk speed to 288 RPMs.]
 - 3. Incompatable CPU chip.
[Replace CPU chip. See page A-17]



C. GENERAL INFORMATION

THE VANILLA 810...

After it's powered up, your 810T will automatically recognize the density of the first disk inserted without configuring the disk drive. The 810T automatically configures to match the density of the boot disk.

It first expects double density. If the first disk is single density, the 810T just backs up, kicks into single density mode and reads its' little heart out. This is automatic. Once the 810T is in either single or double density mode, it remains in that mode until the computer is turned off and a disk of another density is booted or until it is re-configured through software. If you re-power the drive alone, it resets to double density but the computer stays in the previous density. If this happens and the console and drive aren't in sync, pressing <SYSTEM RESET> will configure the console to the same density as the disk drive.

Don't worry about slipping the wrong disk in there. If it's in single mode and you insert a disk that's formatted double, or vice-versa, it won't hurt anything. The 810T will just growl a few times until it's tired of trying and then just error out.

Right now, the point is, your 810T will act just like the 810 it was before, a vanilla 810, whenever you insert one of your existing disks. If your 810 could read a disk or operate a program prior to becoming one of the big guys, it can still do the same thing with those disks and programs without your having to train it. It already knows what to do. Just power up the drive, boot up one of your old disks, and your 810T will act as if it were never converted.

=====

GENERAL INFORMATION

=====

DO'S AND DON'T'S...

DO... make sure your read/write head is clean as we mentioned in the installation section. Using the prescribed method, we suggest cleaning the head every three months if you smoke or have your 810T in an environment that may be dusty, smoggy, etc. If things are on the sterile side, every six months is okay.

DO... make a habit of checking the speed on your 810T on a weekly basis. It doesn't take that long to do and it does pay off. The controller chip in your 810T has a data separator characteristic that allows for a greater speed tolerance in single density but double density speed is critical. Most of us just place the top half of the cover on and don't bother to screw it down. Whatever you do, don't ever leave the cover off for any reason other than this DO, the above DO, or service.

DO... make backup copies of everything you write or own that is of importance. Your 810T is a tough brute that isn't that sensitive but any double density drive is a little trickier than the single density drives.

DO... re-format your disks from now on. The ones you have formatted now will work okay, but formatting them with the 810T will give you a faster read/write.

DO... **ALWAYS** write protect any disk you are about to duplicate. An ounce of prevention is worth a ton of cure.

DO... use only N/DOS or OS/A+ v.2.1 if you intend to mix with any ATARI DOS. They are compatable. ATARI DOS and OS/A+ v.4.1 are not compatable. For example, if you use TEXT WIZARD, you can save your text files on a double density disk only if you use N/DOS or OS/A+ v.2.1 (see page C-7).

DON'T... turn your 810T on or off with a disk in it. This is a bad habit. You'll save blown disks if you remove them first.

DON'T... try to use OS/A+ v.4.1 with any other DOS. It's not compatable with N/DOS or OS/A+ v.2.1 and won't mix with any ATARI DOS. It's in a class all by itself.

=====

GENERAL INFORMATION

=====

A COUPLE OF POINTS...

It's okay to use the same type of disk you've been using. They will work and as long as you make backups, you're covered. This is not, however, recommended and it is strongly suggested that you get into the habit of using disks certified for double density. You may pay a little more for them, but you'll sure sleep better. Double density certified disks, by the way, are even better for single density use.

You have been supplied with N/DOS GENERATOR, a patch to create a powerful complete Atari 2.0 double density DOS. Get used to double density because NCT is currently developing MACH 2XH DOS which is an upgrade to N/DOS. When it's available (Jan. 84), you will receive your copy for the cost of the disk and shipping and handling - \$5.00 total. The speed of MACH 2XH DOS in double density operation will surprise you.

Right now, double density read and write will sound slower than single density to you. Just remember it's reading and writing twice as much data between beeps (256 bytes vs. 128 bytes). It's actually transferring data faster than single density.

IMPORTANT HINT - keep your operation disks stored toward the outer edge of the binder when they're in the cover pockets. When you close the binder with the disks in it, the rings can press against them if they're toward the center and blow the disk.

First thing you want to do after your 810T board is installed and tested is make backups of all the operation disks provided in your kit. (pages G-4 and G-5 for OS/A+ disks and function J. Dup Disk from the N/DOS menu for the N/DOS GENERATOR disk. None of them are protected and replacements would cost you \$10.00 each from NCT.

810 TURBO

GENERAL INFORMATION

READING THE OPERATION SECTIONS...

Throughout the OS/A+ BASICS and N/DOS sections on disk operation, there is a distinction between what will appear on your monitor and what you must type in. Three print styles are used for these distinctions.

First, the print style you see right now, with no underline, will continue to signify instruction or comment. These comments will always be right next to the left edge of copy, with or without a number. Instructions are numbered, comments are not.

Secondly, when you see condensed print, it will signify what you should be seeing on the screen. These screen representations will always be indented somewhat on the page. For example:

NCT 810 TURBO OS OSS/A+ v.2.1
Single/Double Dens (c) 1983 OSS

D1:

will be the first thing you'll see when we tell you to boot up the OS/A+ v.2.1 disk. (It will then scroll an intro, but we'll just use this first part for our example.) There is no distinction in print for inverse characters.

The third type style will simply be standard print but it will be underlined. All underlined print is what you're supposed to type in, exactly as shown, upper and lower case. If there is a space in what you're supposed to type, it will be underlined. Each underlined space between characters is always just one space, never two. The underlined examples of what you type will always follow screen prompts or be mixed with the screen representation.

So if you see: NCT 810 TURBO OS OSS/A+ v.2.1
 Single/Double Dens (c) 1983 OSS

 D1:DIR <RETURN>

it means you type DIR after the prompt D1:, then hit RETURN.

=====
GENERAL INFORMATION
=====**READING THE OPERATION SECTIONS...** (cont)

Underlined standard print will also be used for subject headings. In this case, the underlined headings will always be located at the left margin of the page.

When you press **<RETURN>** in any of the instructions, before executing the next step, you must wait until the next prompt appears on the screen and/or until the drive completes the operation the RETURN started.

Throughout the disk operation sections:

Arrow brackets < and > will signify a single key input.

Parenthesis indicate the type of operation:

(S/S) signifies Single density to Single density

(S/D) signifies Single density to Double density

(D/D) signifies Double density to Double density

(D/S) signifies Double density to Single density

(2.1S/D) signifies 2.1 Single density TO Double density, etc.

(2.1S),(2.1D) signifies 2.1S AND 2.1D, etc.

If more than one density to density is shown, it means that those shown can be done with the same exact instruction or a slight variation, assuming the source disk is formatted as the first density shown. A separate heading at the end of the page will show the slight variations or confirm that there are no variations.

Parenthesis will also be used for sub-notations. The differences between the two uses of parenthesis is easy to distinguish.

=====

GENERAL INFORMATION

=====

CONFIGURING THE 810T AND/OR THE CONSOLE...

There are a number of ways to configure the 810T and/or the console to either Single or Double density.

POWER-UP: (Turning on the 810T with no disk)

D - Any time the 810T is powered up, the default configuration is double density until it reads it's first disk. You can turn the 810T on and off at will during any operation (WITHOUT a disk in it, please!) and it will default to double density until it reads the next disk. This is a quick method for re-configuring from single to double. Just remember, the console is still in the previous density mode. (See RESET below).

BOOTING: (Turning on the CONSOLE with a disk in the 810T)

D - Booting up a Double density disk.
S - Booting up a Single density disk.

RESET: (Pressing <SYSTEM RESET>)

Performing the same function it does with ATARI DOS, <SYSTEM RESET> will clear everything, send a status request to the disk drive, then wait at the beginning of whatever program is in RAM. The CONSOLE will re-configure accordingly. Pressing <SYSTEM RESET> will re-configure the CONSOLE to:

D - If the 810T alone was just previously re-powered.
D - If the last sector read by the 810T was Double density.
S - If the last sector read by the 810T was Single density.
S - If the 810T was just previously re-powered and attempted to read a Single density disk (while the computer was still in double density).

OS/A+ CONFIG: (OSS pages 22-23 and 64-65)

Running CONFIG is another way.

D - (2.1 or 4.1) D1: CONFIG 1D <RETURN>
S - (2.1 only) D1: CONFIG 1S <RETURN>

Play with CONFIG back and forth to see what you can and can't do.

N/DOS P. Set Density FUNCTION: (page D-4)

D and S - both (prompts on N/DOS menu are self explanatory)

=====

GENERAL INFORMATION

=====

AN EXAMPLE... (TEXT WIZARD)

Here's an example of how to save data files on a double density disk after you've booted up a single density program. If you have TEXT WIZARD, you can now store twice as much text on a disk.

1> Initialize a disk with N/DOS I. Format Disk function while in double density or OS/A+ 2.1D (page G-10).

Now we'll start with everything off so you'll know how to do this from now on.

- 2> Power up your 810T
- 3> Boot up TEXT WIZARD (DON'T press START yet)
- 4> Remove TEXT WIZARD from the 810T
- 5> Power down the 810T
- 6> Power up the 810T
- 7> Press <SYSTEM RESET>
- 8> Now press <START>
- 9> Insert the initialized disk (text file disk) into the 810T

You are now ready to write your text according to the TEXT WIZARD manual and you'll be saving the text files on a double density disk.

Remember, OS/A+ 4.1D is not compatable with Atari DOS, so you can't use it with TEXT WIZARD.

This can be done with any program that accesses the disk by file name. It won't work if the program is written in single density and accesses any data by NOTE and POINT or any byte search and access directly from the disk.



GENERATING N/DOS...

THE N/DOS PROVIDED IN YOUR 810T KIT IS NOT A DOS IN ITSELF. IT IS A PROGRAM TO GENERATE N/DOS THROUGH ATARI 2.0 DOS WHICH YOU MUST PROVIDE.

ONCE GENERATED, N/DOS IS A COMPLETE DOUBLE DENSITY ATARI DOS THAT WILL DUPLICATE ANY FUNCTION AVAILABLE THROUGH OS/A+ v.2.1 EXCEPT PATCHING PROGRAMS AND CONVERTING DOUBLE DENSITY TO SINGLE DENSITY WITH JUST ONE DRIVE. HOWEVER, YOU CAN CREATE A SELF-BOOTING AUTORUN.SYS FILE WITH N/DOS, A CONVENIENCE THAT CANNOT BE DONE WITH EITHER OF THE OS/A+ OPERATING SYSTEMS.

FOLLOW THESE INSTRUCTIONS CLOSELY. ONCE YOUR FIRST N/DOS IS GENERATED, COPIES ARE EASILY MADE WITHOUT HAVING TO GO THROUGH THIS PROCESS.

You must provide an UNMODIFIED Atari 2.0 DOS for generation to N/DOS. If it's modified, it won't work.

1> Remove BASIC cartridge from console.

2> Boot Atari 2.0 DOS

Atari DOS menu will appear on the screen with prompt
SELECT ITEM OR <RETURN> FOR MENU

3> Remove Atari 2.0 DOS disk

4> Insert 810T N/DOS GENERATOR disk

5> L <RETURN>

6> LOAD FROM WHAT FILE?

NDOSGEN <RETURN>

The N/DOS GENERATOR menu will appear on the screen.

Ignore the parameter changes for now. You can find out about them in the N/DOS ADVANCED section (page C-6).

7> Press 6

8> Should the system disk be FORMATED? Y <RETURN>

9> Put new SYSTEM disk into Drive 1

Press <START> when you are ready

Insert a blank disk and press <START>

Soon your new N/DOS menu will appear on the screen. You now have N/DOS on a double density disk. See next page (D-2) to create a single density version.

CREATING A SINGLE DENSITY N/DOS...

ONCE YOU GET USED TO USING DOUBLE DENSITY, IT ISN'T TOO LIKELY YOU'LL NEED A SINGLE DENSITY N/DOS, BUT HERE'S THE WAY TO CREATE ONE IF YOU DO WANT IT.

Have a disk ready that's been formatted in single density.

- 1> Boot N/DOS (DD). Menu will appear with prompt:
- 2> SELECT ITEM OR <RETURN> FOR MENU
P <RETURN>
- 3> Change Density for Drive?
1 <RETURN>
- 4> Drive is Double, Type "Y" to change
Y <RETURN>
- 5> Menu will appear with prompt:
 SELECT ITEM OR <RETURN> FOR MENU
INSERT A SINGLE DENSITY FORMATTED DISK IN THE 810T
- 6> H <RETURN>

The computer is now writing N/DOS to a single density disk.

If you boot up N/DOS (DD) your 810T will be configured to DOUBLE density and all the functions on the N/DOS menu will perform in DOUBLE density. The I. Format Disk function, for example, will format the next disk in DOUBLE density, etc.

If you boot up N/DOS (SD) your 810T will be configured to SINGLE density and all the functions on the N/DOS menu will perform in SINGLE density. The I. Format Disk function will format the next disk in SINGLE density, etc.

On the next page, you'll see how to use the P. Set Density function and select the format density regardless of which N/DOS you boot.

USING N/DOS...

THERE ARE THREE DISTINCT MAJOR ADVANTAGES IN USING N/DOS OVER OS/A+ 2.1. FIRST, YOU WILL BE USING A DOS AND DOS MENU THAT YOU ARE FAMILIAR WITH. IT'S THE SAME EXACT MENU AS THE ATARI 2.0 WITH THREE NEW EXTENSIONS. SECONDLY, IT IS TOTALLY COMPATABLE WITH ATARI 2.0 AND ANY PROGRAM WRITTEN UNDER ATARI 2.0. THERE ARE SOME EXCEPTIONS TO THIS USING OS/A+. THIRDLY, YOU CAN CONVERT SINGLE DENSITY DISKS TO DOUBLE DENSITY WITHOUT HAVING TO CONVERT FILE BY FILE. IT CAN BE TIRESOME CONVERTING A DISK LOADED WITH FILES AND HAVING TO EXCHANGE DISKS WITH EACH FILE ON A ONE DRIVE SYSTEM. WITH N/DOS THE MAXIMUM NUMBER OF SWAPS, DEPENDING ON HOW LOADED THE DISK IS, WOULD BE THREE.

Standard Atari DOS incorporates a feature that doesn't make a lot of sense so N/DOS took the liberty of straightening it out. How many times have you been hit with the prompt to "PLEASE TYPE 1 LETTER" after you inadvertently pressed two keys to input a function off the DOS menu? Since they are all one key inputs, there isn't much sense to having you input the key AND hitting <RETURN>. With N/DOS they are truly one key inputs and the next prompt immediately comes on the screen. There is no need to hit <RETURN>. The letter you input is not echoed on the screen but the prompt repeats the function so you can recognize which one you just called.

Another feature of Atari's DOS that is changed in N/DOS is the O. DUPLICATE FILE (on N/DOS it's O, Dupe File). With Atari 2.0, if you have only one drive and you want to dupe a bunch of files with a wild card combination, you have to swap disks for each file duped. Not anymore. N/DOS will load all the files you request until memory is full, then prompt you to insert the destination disk. This will save you a lot of work. This actually makes Dupe File work like Dupe Disk, if you want it to, by just hitting <RETURN> or inputting '*,*' at the filename prompt. ONE MAJOR DIFFERENCE: Dupe Disk WILL duplicate DOS.SYS and DUP.SYS, whereas Dupe File will NOT.

USING N/DOS,,, (cont)

With the exception of the minor differences mentioned on the previous page, your N/DOS menu extensions A to O are the same as those on Atari 2.0 and operate exactly the same way. The three additional extensions and how they function are as follows:

P, Set Density - allows you to set the density of the disk drive and the console. The density setting of both occur at the same time. Use the following procedure:

- 1> Boot N/DOS. Menu will appear with prompt:
- 2> SELECT ITEM OR <RETURN> FOR MENU
 P <RETURN>
- 3> Change Density for Drive?
 1 (or drive of your choice) <RETURN>
- 4> Drive is Double, Type "Y" to change OR prompt will show:
 Drive is Single, Type "Y" to change
 Y <RETURN>

Typing any other input will cause the density to remain in its previous condition.

The density in both the disk drive and the console is now set and the menu will re-appear. Regardless of which N/DOS you're using (SD or DD), the next function performed on the disk will be in the density that has been set.

You can use this method to verify what the density is, without changing it, simply by typing any key except Y in step 4.

A BLANKET NOTE TO ALWAYS REMEMBER: EVERY FUNCTION ON THE N/DOS MENU WILL WORK IN THE DENSITY THAT THE DRIVE AND CONSOLE ARE CONFIGURED WHEN YOU CALL THAT FUNCTION WITH THE EXCEPTION OF Q, Conv Disk (CONVERT DISK).

Although the Convert Disk function will only convert disk files from single to double density, it really doesn't care what the density is when it starts its operation. Regardless of the density of the drive, it prompts you to insert the Single Density disk (source) and configures the drive to single density to read it. It then configures the drive to double density to write it to the new disk (destination).

USING N/DOS... (cont)

Q. Convert Disk - allows you to convert a file, group of files, or a complete disk from single density to double density. This function is to be used with a one drive system only. It will not recognize multiple drive systems. (Use C. Copy File for multiples, page D-5).

N/DOS will NOT allow you to convert from double density to single with just one drive. It can be done with two, even if one is just a vanilla drive by using the C. Copy File extension.

Have a disk ready that's been formatted in double density (to start a new disk) or one you've already started in double density (to convert individual files).

- 1> Boot N/DOS (SD or DD). Menu will appear with prompt:
- 2> SELECT ITEM OR <RETURN> FOR MENU
 Q <RETURN>
- 3> Enter filespec or <RETURN> for all
 <RETURN>
 To convert the whole disk OR
 filespec <RETURN>
 To convert an individual file OR
 files*,* <RETURN>
 To convert groups of files
 (Any valid wild card combination will work)
- 4> Insert SINGLE DENSITY disk, hit <START>
 Insert the single density (source) disk that you wish
 converted into the 810T.
 <START>

You'll see the individual filespecs displayed as they are loading into memory from the single density disk. When the available memory is full (48K/approximately 230 sectors), or the load runs out of data, you'll be prompted to Insert the Double Density (destination) disk and hit <START> to begin writing. Be certain the destination disk has been formatted in double density. This function does NOT format the disk for writing. Each filespec will be displayed as it is being written in double density.

Just follow the prompts as they appear from there on.

(continued next page...)

USING N/DOS... (cont)**Q. Convert Disk - (cont)**

You can, of course, convert files from multiple single density disks onto the same double density disk with this function. If two or more files with the same name are converted, only the last occurrence of that file will be on the double density disk.

This function will not convert DOS.SYS nor DUP.SYS files to the double density diskette. Use the H. Write N/DOS function for that. It will, however, convert AUTORUN.SYS files.

If the conversion runs into a file that cannot be read or written (bad sector, etc.) it will display:

Error 139: <START>-skip <BREAK>-abort

Just hit <START> to skip that file and go onto the next OR
<BREAK> to abort the whole conversion process.

Again, use this function only if you have one drive. The C. Copy File function is much better for converting disks with two drives.

ALWAYS REMEMBER: When Convert Disk is finished, it leaves the drive in double density configuration.

R. Set Verify - allows you to have N/DOS write WITH verify or write WITHOUT verify, giving you a choice between speed and reliability. Writing with verify is slower, but will reduce the chance for read errors later on. Default, when N/DOS is booted, is write WITH verify.

- 1> Boot N/DOS. Menu will appear with prompt:
- 2> SELECT ITEM OR <RETURN> FOR MENU
 R <RETURN>
- 3> Verify is ON, type "Y" to set OFF OR
 Verify is OFF, type "Y" to set ON
 Y <RETURN>

If you just want to see what mode it's in and not change it, just hit <RETURN> without typing the Y first.

When you've completed the above, the N/DOS menu will return to the screen.

USING N/DOS... (cont)

C. Copy File - allows you to convert a file, group of files, or a complete disk from single density to double density or from double density to single density using two disk drives. This function cannot be used with only one drive. Use Q. Convert Disk for one drive conversion (Single density to double density only, Page D-5).

- 1> Boot N/DOS. Menu will appear with prompt:
- 2> SELECT ITEM OR <RETURN> FOR MENU
- 3> C <RETURN>
- 3> COPY--FROM, TO?
- D1:filespec,D2:filespec <RETURN> OR
- D1:file*,*,D2: <RETURN> OR
- D1:*,*,D2: <RETURN>

Each filespec will be displayed as it is being copied.

If you're copying just one file, you must input the filespec going to the destination drive. It can be the same as it was on the source disk or another name of your choice, but it must be typed in.

If you're using any wild card combination, the filespec(s) do not have to be typed in. They will end up with the same filespec(s) on the destination disk.

You can go in any direction you wish. You may read from D1 and write to D2 or read from D2 and write to D1 (or any two drive number combination). The drive you read from or write to in single density can be a vanilla 810 or any compatable SD drive. The drive you read from or write to in double density must be an 810T (or compatable DD drive).

This function can be used to copy straight across (D/D or S/S) or it can be used to convert (D/S or S/D).

Just remember, Copy File will write to the destination drive in the density in which it's configured regardless of whether N/DOS is SD or DD. Using the P. Set Density function from the menu before you use the C. Copy File function will set the density you choose in the drive of your choice.

ADVANCED N/DOS...

The theory of advanced N/DOS is simply to modify DOS to incorporate the new 810T functions, then relocate DOS's Disk Utility Package (DUP) up in memory by the amount you specify, thereby making more room for other things such as your new code, more disk buffers (required for double density), etc.

Appendix "D" of the Atari DOS II manual has a memory map of both DOS II 2.0S and DOS II 2.0D. Several points about the memory map are significant:

1. The resident portion of DOS resides from \$0700 thru \$1A7C. The manual doesn't say it clearly, but that is the code found in the three boot sectors and the DOS.SYS file.
2. The address space from \$1A7D to \$1D7B (\$247B for 2.0D) is reserved for disk drive buffers and sector buffers. With N/DOS you can control how much of this space is actually used by DOS.
3. The "non-resident" portion of DOS (Disk Utility Package or DUP) resides from \$1D7C through \$3305 (\$247C-\$3A3B for 2.0D). Until now, you had absolutely no control over DUP's location. This is also the address space which is saved on the MEM.SAV file when you return to DOS. The location of 2.0S's DUP is what makes it extremely difficult to extend DOS. You just don't have enough memory space between the resident part and non-resident part to do much.
4. You'll notice that the only difference between 2.0S and 2.0D so far is that the DOS buffer space is \$0700 (1792) bytes larger because DUP is located at a higher memory address. The information given about the 815 drive and memory maps imply that 2.0D will support 8 drives (as compared to 2.0S's limit of 4). As a side note, DOS's disk handler will handle up to 8 drives, either single or double density. DUP limits you to 4, and DUP's location is what limits you to single density.

What this means is that the starting location and length of DOS's buffer, and not the location of DUP, controls the amount of free space you have in Basic or any other program. DUP's location does, however, limit how big the buffer space can be and since 2.0S is optimized to single density disks, it effectively eliminates the use of double density disk drives. N/DOS can change all that.

ADVANCED N/DOS... (cont)

NDOSGEN allows you to customize N/DOS to your particular needs. When NDOSGEN is run (see page D-1, inst. 1-6), the menu to change parameters is as follows:

1. Convert DOS to N/DOS - Allows you to choose whether or not you want an Atari 2.0D DOS or N/DOS. In both cases, DUP's starting point will be relocated (default 07 pages or as you set) to allow for double density and the buffer count will be increased (06 default or as you set), but Atari 2.0D will not allow use of the J. DUPLICATE DISK function in DD nor will it have the additional three extensions.

Press 1 to toggle the choice between YES and NO

2. Set Relocation Factor - Allows you to establish DUP's starting point. Input a new relocation factor in pages, stated in hexadecimal format. The new relocation factor you input must be a 2 digit, hexadecimal number between 01 and 6C. Remember each page is 256 bytes long. The standard default value is 07 which will produce standard DOS 2.0D placement. This option will not accept any keypress which is not a valid hexadecimal digit nor more than the limit of two digits.

Press 2

Input relocation factor (hex)

Press <RETURN> to set input

3. Set DOS Buffer Count - Allows you to increase or decrease the number of sector buffers you want DOS to use. Pressing <RETURN> will set the number displayed. NOTE: Double density will require at least 6 buffers, and more if you plan to have several files open at one time. N/DOS allows a range of 3 to 20, but you can change the value at any time in the future (see application notes).

Press 3

Use <CTRL> - (UP arrow) to increase buffer count

Use <CTRL> = (DOWN arrow) to decrease buffer count

Press <RETURN> to set count displayed

ADVANCED N/DOS... (cont)

4. Reserve Patch Space - Here is some of the real power of N/DOS! Select this option if you want to reserve memory in the resident part of DOS starting at hex location \$1A7D (6781 decimal). The number input must be in hex, a maximum of four digits and must be less or equal to the relocation factor.

Press 4

Input number of bytes reserved (hex)

Press <RETURN> to set input

5. Activate/Deactivate Drives - As a convenience, you may also have N/DOS interrogate any number of drives during the boot process and during 'warm start' (pressing <SYSTEM RESET>). Inputting a number will cause the drive status to be toggled between active and inactive.

Press 5

Input drive number(s) between 2-8 to activate

Input drive number(s) between 2-8 to deactivate

Press <RETURN> to set choice(s) displayed

6. Generate System - Generates your custom N/DOS after you have completed your choices (see page D-2, inst. 7-9).

Press 6

Press Y <RETURN> or N <RETURN> to format disk prompt

Insert BLANK disk into 810T

Press <START>

ADVANCED N/DOS... (cont)

APPLICATION NOTES:

1. **ADDING YOUR OWN RESIDENT CODE** - There are several considerations when adding your own code to DOS 2.0. The following will help determine such things as where to put it, how much space to reserve, etc.

A. **LOCATION** - The space reserved by N/DOS starts at location \$1A7D (6781 decimal). You should insure that your code "origin" is equal to or greater than \$1A7D.

B. **HOW MUCH SPACE** - Simply subtract \$1A7D from the high address used by your routine. The result is the amount of space you should tell N/DOS to reserve.

C. **INITIALIZATION** - Locations \$704 and \$705 hold the address that Atari's ROM operating system will "jump" to during both cold start (boot time) and warm start. If you want to get control during either of these times, you should place the address of your initialization routine in these locations. Remember three things: First, the location is in standard 6502 format (LSB followed by MSB). Second, Your initialization routine must "jump" to the routine whose address was at locations \$704 and \$705. Third, remember the DOS disk handler has not been initialized at the time ROM OS jumps to this address (DOS initialization is the routine normally pointed to by location \$704).

D. **LOADING YOUR ROUTINE** - Your routine should be in Atari's standard load file format for machine language programs. Just use the L. Binary load function. Your routine will load into the reserved space (if it's origin is as stated in "A" above). Then use the H. Format Disk function to make your routine permanent. If you have some special installation code, you can use either the "INIT" or "RUN" vectors which are supported by DOS to invoke your installation procedures.

(continued next page...)

ADVANCED N/DOS... (cont)

APPLICATION NOTES: (cont)

2. SETTING THE DOS BUFFER COUNT -

In the DOS II user's manual this is referred to as "number of concurrent files". Actually, it defines the number of 128 byte buffers that DOS will reserve above and beyond what it needs for its' own use. Double density drives currently use 256 byte sectors and need a 256 byte buffer so you must figure out how many buffers you want to give DOS then double that number for double density drives. Location \$709 is used by DOS to keep track of this number. You may use N/DOS to set it, or you can do it yourself with a POKE 1751,n where "n" is the number of buffers you want DOS to use. Remember, if you do it yourself, you must, after you poke 1751,n, use the H. Write DOS Files function for DOS to "remember" the change.

3. CHANGING THE AMOUNT OF SPACE YOU RESERVE - DOS locations \$70C and \$70D (1804 and 1805 decimal) hold the address that the DOS buffer space starts. If you need more (or less) space, you can change these locations. Remember, the location is stored in the 6502 address format with the LSB in \$70C and MSB in \$70D.

=====

E.

=====

=====

MACH 2XH DOS

=====

MACH 2XH DOS IS AN ADVANCED N/DOS THAT WILL READ AND WRITE DATA FROM DOUBLE DENSITY DISKS AT A RATE THAT IS EQUAL TO OR IN EXCESS OF 4 TIMES THE RATE OF A VANILLA 810.

NCT IS CURRENTLY DEVELOPING MACH 2XH DOS AND IT IS ESTIMATED THAT IT WILL BE AVAILABLE IN JANUARY, 1984.

MACH 2XH DOS IS, IN ESSENCE, INCLUDED IN YOUR 810T KIT. YOU WILL BE NOTIFIED OF ITS' AVAILABILITY AND CHARGED \$5 TO HANDLE THE COST OF THE EXTRA DISK AND EXTRA SHIPPING COST. WE FEEL THIS IS A FEASABLE AMOUNT TO COVER COSTS.

THIS SECTION OF THE MANUAL IS RESERVED FOR DOCUMENTATION THAT WILL ACCOMPANY THE DISK.



CONFIGURING THE 810T THROUGH SIO COMMANDS...

The 810T recognizes two additional SIO commands over and above the normal five the vanilla drive understands (see the Atari Technical User Notes pages 130 - 140-D and page 175 for an explanation of SIO usage). The following is a list of the SIO command bytes accepted by the 810T.

<u>Command name</u>	<u>ASCII</u>	<u>Hex</u>	<u>Description</u>
READ	R	\$52	Read a sector 128/256 byte data frame AUX1 & 2 = sector lsb/msb
WRITE	W	\$57	Write and verify a sector 128/256 byte data frame AUX1 & 2 = sector lsb/msb
STATUS	S	\$58	Get status bytes see tech. notes, page 88 see note 1, page F-3
PUT (no verify)	P	\$50	Write a sector, no verify 128/256 byte data frame AUX1 & 2 = sector lsb/msb
FORMAT	!	\$21	Format a disk in current density 128/256 byte data frame

The two additional commands recognized by the 810T are:

RDOPT	N	\$4E	Read option table (next page)
WTOPT	O	\$4F	Write option table (next page)

S10 TURBO

ADVANCED NOTES

CONFIGURING THE 810T THROUGH SIO COMMANDS... (cont)

OPTION TABLE - RDOPT and WTOPT both use a twelve byte data frame as follows:

BYTE DESCRIPTION

0	Number of tracks (810T ROM returns 40, ignores during WTOPT)
1	Step rate 0 - 6ms 1 - 12ms 2 - 20ms 3 - 30ms (810T ROM returns 3, ignores during WTOPT)
2&3	Number of sectors per track (see note 2, page F-3) (810T ROM returns 18, ignores during WTOPT)
4	Number of sides (810T returns 1) (MUST BE 1 on WTOPT - see note 3, page F-3)
5	Density 0 - single density 4 - double density
6&7	Number of bytes per sector (i.e. sector size used by SIO) (810T returns 128 in single density, 256 in double density) (810T ignores during WTOPT)
8	Drive present 0 - drive not on line 1 - drive present (810T ignores during WTOPT)
9	ACIA initialization bits (change data communication rate, ignores during WTOPT)
10	future expansion
11	future expansion

DIFFERENCES BETWEEN 2.1 AND 4.1...

Two OSS DOS systems are provided with your 810T. The first is 2.1 (OS/A+ v.2.1) and the other is 4.1 (OS/A+ v.4.1).

The 2.1 master is on a single density disk (2.1S) and can be used for both single density and double density operation. It IS compatable with DOS 1.0 and DOS 2.0 issued by ATARI. It is NOT compatable with ATARI 3.0.

The 4.1 master is on a double density disk (4.1D) and is NOT compatable with 2.1, nor is it compatable with any ATARI DOS. 4.1 will do everything 2.1 will do in double density plus give you 3 other major operational features:

1. You can put up to 105 files on double density disk versus 64 with 2.1 in either single or double density.

2. File names can be up to 30 characters long. Extenders are not recognized as extenders with the exception of .SYS, .COM, and .EXE. Any alpha, numeric, or punctuation characters can be used in the file name with the exception of Control Characters, Space, Comma (,), Asterisk (*) and Question Mark (?). As opposed to 2.1 and ATARI DOS, the first character in a file name can be any accepted character. These are all accepted file names:

PA

PERSONAL,ADDRESSES

213-PERSONAL-ADDRESSES.WYO

[HOT]>23"RICH"BUYERS&USERS/NEV

3. True random access of data files. Note and point reference a byte offset relative to the beginning of the file.

Example: If the record length of a file is 50 bytes long, POINT #1,0,50*7 will access the 7th record of that file.

Further detail on version differences can be found in the OSS section starting on page 140.

A COUPLE OF POINTS ABOUT 2.1 AND 4.1...

When you boot either the 2.1 or the 4.1 master disk, you'll go through an intro for a couple of minutes that announces NCT, the 810 TURBO and OSS. That intro process comes from a batch processing file called STARTUP.EXC. It was left on the master disks so you could get an idea of how batch processing files work. Quick instructions on how to develop batch processing are included in the intro. Read page 13 in the OSS section for a thorough explanation of this.

You will end up with three original OS/A+ masters. We provided you with 2.1S and 4.1D. You will make a 2.1D. Do bear in mind, when you make your 2.1D, the heading on boot will still say that it's 2.1S. If you have TEXT WIZARD, it would be a good exercise for you to see if you can change the notice to 2.1D.

Since 4.1 is strictly double density, a single density version would be non-functional.

We suggest you keep the three original masters in a safe place with the STARTUP.EXC file on them for reference, and use the three duplicate masters for everyday computing, with the STARTUP.EXC file ERAsed from them (see OSS section, page 47). This way you don't have to go through the intro every time you boot up a master OS disk.

When you run the HELP file, you'll see a command called DUPFILE. OSS neglected to rename this to 'COPY for one disk drive'. See page 66 in the OSS section for an explanation of 'COPY files' using only one drive.

One of the first parts of the OSS section you might want to study is about intrinsic commands starting on page 42. Two of the intrinsic OS/A+ commands you'll use most are DIR for getting a directory of the disk, and CAR to return you to the BASIC cartridge. Just type them in after you see a D1: prompt and press <RETURN>.

While using OS/A+, if the system seems to go into an endless loop during execution just hit <SYSTEM RESET> and it will return you to DOS with the D1: prompt. Just type RUN <RETURN> at the prompt and it will return you to the same function you were in. You don't have to re-load it.

ABOUT THIS SECTION AND THE OSS SECTION...

The instruction portion of this section is a simplified explanation of a few OS/A+ functions. It is written for one drive use only and is meant to introduce you to OS/A+ and the 810T.

If the instruction given in this section has a reference in the OSS section, there will be a reference page number shown at the heading of each page on the same line as the OS/A+ BASICS title. That reference page number in OSS will also be for one drive operation with the page(s) following explaining multiple drive operation.

The OSS section is the last section in this manual, pages 0 to 152 (no alpha prefix). For those of you who want answers and reasons and want to go into more detail than covered in this section, you'll find those answers in the OSS section. You should take the time to read the entire OSS section. It has information that isn't even touched upon here.

When you first refer to the OSS section, or when you turn to it to read it all, be sure to read page 0 first. That page explains some of the the references in the OSS section that do and don't apply to the 810T. This is necessary to prevent any confusion when reading the OSS instructions.

The information and examples in this section are simple and brief enough to allow you to familiarize yourself with OS/A+ and the 810T. Once you've gone through this section and familiarized yourself with the basics, you can then study the OSS section for more complete details of operation.

The operations explained in this section pertain to creating duplicates of your 2.1 and 4.1 DOS master disks and converting disks and files from single density to double density. As stated, make sure you have backups of all the disks provided in your 810T kit. You should create backups before you do anything else.

FORMATTING A DISK... (2.1S/S), (2.1D/D), (2.1S/D)

This is the procedure for formatting a disk with 2.1S and 2.1D to the same density. Whichever master you boot up, Single or Double, the newly formatted disk will be formatted in that same density.

BE CAREFUL! THE SCREEN DOESN'T PROMPT YOU TO INSERT A BLANK DISK. PAY ATTENTION TO STEP #5.

- 1> Boot 2.1 master disk, either Single or Double
- 2> D1: INIT <RETURN>
- 3> 1. FORMAT DISK ONLY
2. FORMAT DISK AND WRITE DOS.SYS
3. WRITE DOS.SYS ONLY
4. RETURN TO OS/A+
ENTER FUNCTION NUMBER: 1 <RETURN>
- 4> ENTER DRIVE (1,2,3, OR 4): 1 <RETURN>
- 5> FUNCTION 1; DRIVE 1
ARE YOU SURE (Y OR N)
Insert blank disk, type Y, <RETURN>
- 6> TASK TERMINATED NORMALLY
HIT RETURN FOR NEXT FUNCTION <RETURN>

Initializing a disk with 2.1 to the same density as the master using INIT does not automatically put DOS.SYS on the newly formatted disk. Step #3 gives you the option of writing DOS.SYS to the disk. Remember, without DOS.SYS, the new disk won't boot.

Also remember, whichever density master you booted is the density the new disk is formatted in.

To format a double density disk from 2.1S (2.1S/D):

- 1> Boot 2.1S master disk.
- 2> D1: INITDBL <RETURN>
- 3> DRIVE TO INITIALIZE: 1 <RETURN>
- 4> INSERT DISK AND HIT RETURN
Insert a blank disk in the 810T
- 5> Press <RETURN>

Using INITDBL for formatting a double density disk automatically writes DOS.SYS to the newly formatted double density disk.

FORMATTING A DISK... (4.1D/D)

Here's how to format a disk with 4.1D. It's similar to 2.1 but writing DOS.SYS to the new disk is very different. The new disk will, of course, be formatted in double density.

1> Boot 4.1D master disk
2> D1: INIT <RETURN>
3> DRIVE NUMBER ? 1 <RETURN>
4> INSERT DISK INTO DRIVE 1
AND HIT RETURN WHEN READY
Insert blank disk in 810T <RETURN>
5> INITIALIZATION COMPLETE
INIT ANOTHER DISK ? N <RETURN>

If you don't want DOS.SYS on the new disk, you are now finished.

If you do want DOS.SYS on the new disk, perform this last step:

6> D1: SAVE DOS.SYS 700 23FF <RETURN>

DUPLICATING A DISK... (2.1S/S), (4.1D/D)(2.1S/S):

- 1> Boot 2.1 master disk.
- 2> D1: DUPDSK <RETURN>
- 3> Source Disk Drive (1,2,3,4): 1 <RETURN>
- 4> Destination Disk Drive (1,2,3,4): 1 <RETURN>
- 5> Format Destination Disk (Y OR N): Y <RETURN>
- 6> Put Source Disk in Drive 1
When Ready, Hit RETURN

7> Insert source disk in the 810T (2.1S master in this case)

8> Press <RETURN>.

9> Swap source and destination disks as directed by prompt.

When the backup is complete the prompt will ask if you want another copy. If you do, you will repeat steps 6 to 9. Since you chose to format the first backup, it will also format each copy thereafter. If you choose not to make another copy, the screen will return to the D1: prompt. This repeat copy procedure will hold true for any disk duplicating operation.

(4.1D/D): To duplicate the 4.1 master, just boot up 4.1 instead of 2.1 and use the same procedure as above. You will, of course, use the 4.1 master as the source disk in step #7.

These are the same methods for any (S/S) using 2.1S and (D/D) using 4.1D. The source disk would simply be the one you want copied.

CONVERTING A DISK... (2.1S/D)

This is the procedure for converting a disk from single to double density using DSDCONV (Disk Single/Double Conversion) using one disk drive. It can also be used for converting individual files or groups of files. It will not convert DOS.SYS and it cannot be used for down conversion (Double to Single).

DSDCONV was developed by Hadley Stacey expressly for NCT and is not an integral part of the OSS release. Therefore, there is no reference to it in the OSS section.

1> Boot 2.1 master disk either Single or Double

2> D1: DSDCONV <RETURN>

To convert the whole disk OR

DSDCONV filespec <RETURN>

To convert an individual file OR

DSDCONV files*.* <RETURN>

To convert groups of files

(Any valid wild card combination will work)

3> Insert SINGLE DENSITY disk, hit <START>

Insert the single density (source) disk that you wish converted into the 810T

4> <START>

You'll see the individual filespecs displayed as they are loading into memory from the single density disk. When the available memory is full (48K/approximately 230 sectors), or the load runs out of data, you'll be prompted to Insert the Double Density (destination) disk and hit <START> to begin writing. Be certain the destination disk has been formatted in double density. This function does not format the disk for writing (Use INITDBL for this so DOS.SYS will be on the new disk [page G-4]). Each filespec will be displayed as it is being written in double density.

Just follow the prompts as they appear from there on.

One important point - when it's finished converting, it leaves the drive in double density configuration.

The procedure for handling timeout ERRORS is found on page D-5.

DUPLICATING A DISK... (2.1D/D)

Now that you have a 2.1D master, you can make a backup of it using this method.

1> Boot 2.1D master disk.

2> D1: DUPDBL <RETURN>
3> Source Disk Drive (1,2,3,4): 1 <RETURN>
4> Destination Disk Drive (1,2,3,4): 1 <RETURN>
5> Format Destination Disk (Y or N): Y <RETURN>
6> Put Source Disk in Drive 1
When Ready, Hit RETURN

Insert source disk in the 810T (2.1D in this case)

7> Press <RETURN>

8> Swap source and destination disks as directed by prompts.

This is the same method for any (D/D) using 2.1D. The source disk would simply be the one you want to duplicate.

CONVERTING A FILE... (2.1S/D)

This is the procedure for converting an individual single density file or group of single density files to double density. A whole disk can be converted this way but it can be tedious. For whole disk S/D conversion, DSDCONV is better (page G-8). Read this page and the next page completely before starting.

- 1> Boot 2.1 master disk.
- 2> D1: INITDBL <RETURN>
- 3> DRIVE TO INITIALIZE: 1 <RETURN>
- 4> INSERT DISK AND HIT RETURN
Insert a blank disk in the 810T
- 5> Press <RETURN>
- 6> Remove initialized disk from 810T
- 7> Insert 2.1S in 810T
- 8> D1: SDCOPY **,* <RETURN>
Insert disk(s) to be copied
and hit return when ready
Insert source disk in 810T (2.1S in this case)
- 9> Press <RETURN>
- 10> Insert 'to' disk and hit return
Insert the initialized disk in the 810T
- 11> Press <RETURN>
- 12> D1: DOS.SYS
already exists
OK to overwrite?
Insert source disk in the 810T, type N <RETURN>
- 13> DOS.SYS not copied
Insert 'to' disk and hit return <RETURN>
- 14> Swap 'from' and 'to' disks as directed by prompts.

(continued next page...)

CONVERTING A FILE... (2.1S/D) (cont)

This procedure is used primarily for transferring individual files from a single density disk to a double density disk. Before attempting any conversion of single files, read the OSS section on this starting with page 39. There are some flags that must be considered before converting single files.

This method is tedious if you want to convert a complete disk from single density to double density using OS/A+ - file by file. So you can get the hang of it, you might want to try it with a disk that has just a couple of files. If your disk has a lot of files on it, it is suggested you use the DSDCONV Function or the N/DOS Q, Convert Disk function.

When you initialize a disk with INITDBL, it automatically writes DOS to the disk. When it queries you about overwriting DOS (step #12), you want to answer NO, after you've inserted the source disk in the 810T. If you take DOS off the new disk, you'll never get it to boot. If the new disk is strictly a data file disk that you'll never boot and you need the storage space, it's okay to overwrite DOS. Put a big red star on that disk without DOS. If you ever try to boot it, all kinds of crazy things may happen, possibly wiping something out on the disk.

UTILITIES PACKAGE INFORMATION...

Your S10T UTILITIES disk is not protected. **MAKE A BACKUP COPY OR TWO IMMEDIATELY!** Replacement from NCT will cost \$10.00 if you have to order another copy.

With one exception the utilities will work with any drive number (1-4) but it is recommended that you always use Drive 1. The exception is PACKEMUP. Due to the nature of PACKEMUP, you have to MAP the disk which is going to be PACKeD onto the destination disk. If it's a boot disk, it has to boot on Drive 1.

ALL OF THE UTILITY PROGRAMS ARE TO BE RUN WITHOUT THE BASIC CARTRIDGE. DO NOT USE THE BASIC CARTRIDGE.

A minimum of 32K of memory is necessary to run the utilities.

The UTILITIES disk is a single density disk and all the programs are to be run in single density **ONLY**. There is no need to make a double density duplicate.

Each screen is divided into three sections to begin. The top is the title and copyright notice. The center is the menu or parameter area. The bottom is the instruction and/or option area. As you get into the program, the center may turn into the result display and/or instruction area.

Displayed instructions are very user oriented, so the rest of the manual is written in straight forward instruction instead of the monitor screen format used in previous sections.

After using the utilities, if you have any constructive comments on improvement, addition, etc., we would like to hear from you. Please give us a call or drop us a line.

Every attempt has been made by NCT to provide you with a utility package that will utilize the efficiency and power of your Atari. If it's any indication of how much effort and dedication went into the development of this package, the primary author of the disk is currently allowed to leave the grounds to visit family every other Sunday - so long as he is escorted by no less than two 7th degree black belts and a full carton of Kleenex (he sobs a lot).

Enjoy your new power...

AND PLEASE, PLEASE READ THE INSTRUCTIONS CAREFULLY.



I.**BACKEMUP****CHANGING PARAMETERS...**

Pressing **A** on the UTILITIES menu will load BACKEMUP.

BACKEMUP is a utility program that will allow you to backup any disk currently available, protected or otherwise, to protect your investment in commercial software. It is not intended as a tool to be used for the unlawful copying, sale or distribution of copyrighted software.

The BACKEMUP menu will show the following default parameters:

FROM (source) drive	:	1
TO(destination) drive	:	1
number of COPIES	:	1
Skew Recovery Mode	:	Regular

As shown in the instruction area, there are three options:

<OPTION> - This will toggle the choice of the Skew Recovery Mode between Regular and Extended. Each time you press **<OPTION>**, the instruction area clears and re-appears and the current mode will display right where the word Regular is.

Without going into a lot detail, suffice it to say that the Regular mode will duplicate over 95% of the protected software on the market. It does the job rather quickly compared to the Extended mode. Regardless of what disk you are trying to duplicate, try the Regular mode first.

The Extended mode is available to handle the new protect schemes. The random skewing and other methods used require this type of write for consistency. If the Regular mode doesn't work, revert to the Extended mode. Depending on the disk, this could take a while to get the job done. It may appear as if it's stuck on a loop but it isn't. It's just trying to find a match skew necessary to write that particular track. Just let it keep trying - it'll find what it's looking for. (see page I-4)

Either mode may duplicate the disk and write it to another disk but you really don't know if the operation is a total success until you boot up the duplicate. You can't be sure till your space ship zaps the first alien.

810 TURBO

BACKEMUP

CHANGING PARAMETERS,,, (cont)

<SELECT> - This will put you in the mode to select FROM (source) drive, TO (destination) drive and number of COPIES. A new set of instructions will appear in the instruction area and the cursor will appear on the first number 1 on the FROM drive line.

Pressing **<RETURN>** will cause the displayed parameter to remain unchanged and the cursor to skip to the next parameter for input.

Input the number of your choice, then press **<RETURN>** to set the parameter and move on to the next parameter for input.

You may select FROM drive 1-4, TO drive 1-4 and up to 2 copies written from one reading. Inputing any number above these maximums will be ignored.

Once the cursor moves off the number of COPIES parameter, it will skip over the Skew Recovery Mode line and the instruction area will revert to the original instruction display. You may press **<OPTION>** or **<SELECT>** again if you wish to change parameters before selecting to backup a disk.

<START> - Once you have selected the skew recovery mode and set the parameters you wish, you must then press **<START>** to get onto the actual duplication.

DUPLICATING A DISK...

Pressing <START> to begin the duplication will clear the BACKEMUP menu from the screen and a new set of instructions will appear in the instruction area. Always attempt the duplication in the Regular skew recovery mode before reverting to the Extended mode.

As per instructions, insert the FROM (source) disk in the specified drive, press <START> and the 810T will begin reading the source drive.

As each track is read, it will display on the screen with an OK for having been read. If the BASIC cartridge is out, memory will allow the reading of 8 tracks (48K) before you have to swap disks (if using one disk drive). With the cartridge in, it can only handle 4 tracks before you have to swap disks.

Once memory is full, it will stop reading and a new set of instructions will appear in the instruction area. If you're making more than one copy from the reading, the instructions will specify the First or Second destination (TO) disk number to insert.

Remember, the 810T only has to read the FROM disk once per pass regardless of the number of copies you're making. It does not have to read the FROM disk over again for each copy.

As per the instructions, insert the correct TO disk. The TO disk does NOT have to be a formatted disk. BACKEMUP formats each track automatically as it writes it. Press <START> to begin writing to the new disk.

As each track is written, the word 'Writing' overwrites the word 'Reading' on the screen. Once the writing of that pass is complete, the instruction area displays the next instruction to either insert the next disk for Writing (if making more than one copy) or to insert the FROM (source) disk for Reading (if only making one copy). Simply follow the repeated instructions from then on as the duplicating process cycles.

If you have two 810 TURBOS, the disk swapping is not necessary. Drive 1 Reads the FROM disk until memory is full and then Drive 2 automatically takes over and Writes the TO disk (or whatever two drive numbers you specify).

=====

BACKEMUP

=====

EXTENDED SKEW RECOVERY MODE...

The only way you can tell if you need Extended skew recovery mode is if you've duplicated a disk with Regular skew recovery mode and it won't boot.

As mentioned, when you duplicate a disk in the Extended mode, it could take a while.

Even though it can be a drag, give the Extended mode three tries before you call us. You'd have to know some of the protect features that are being used to understand that it may not be duplicated on the first or second try and once it is successfully duplicated, the new disk may not boot properly every time. If it doesn't boot every time, it should run at least a 70% boot factor (7 out of 10 tries).

If it doesn't successfully dupe after three tries with the Extended mode then we really have a monster on our hands. Call us or drop us a line and we'll see what we can do about it.

Pressing <SYSTEM RESET> at any time during the BACKEMUP operation will return you to the BACKEMUP menu.

IF THE OPERATION ABORTS...

If the 810T runs into a track it can't Read or Write, it will abort the operation and an ERROR message will be displayed in the instruction area.

READ abort - If the operation aborts on the first Read track (FROM disk) you either have a blank disk in the drive, no disk in the drive, the drive door is open or your drive speed is off.

If it aborts on any track other than the first Read track (FROM disk) the odds are that your drive speed is off. You might want to give it a second try before checking for speed to see if it does it again. It wouldn't hurt to re-power the drive before you start the second attempt (open door, remove disk, turn drive off, turn drive on, insert disk again, then press <START> to continue). If it aborts again on a READ track, re-boot and use REVCHECK to check the speed.

WRITE abort - If it aborts on the first Write track, all the conditions of the first Read track abort apply plus the possibility of the TO (destination) disk being write protected.

Regardless of what Write track causes the abort, make a note of the track number and try again (re-power drive suggested). Use a different blank TO (destination) disk. BACKEMUP is pretty critical and sometimes a disk that will work under normal conditions won't work with BACKEMUP. Always remember, your odds increase considerably using disks certified for double density, even if you're using them for single density work. On the second try, if it aborts on the same track as the last one with a different TO disk, then we may just have another toughie on our hands. If the same Write track aborts a third time, call NCT. We want to know the name of that program.

If it aborts on a different Write track after three tries on different disks, you've probably got drive speed problems. If speed adjustment and different TO disks don't solve the problem, give us a call.



PACKEMUP INFORMATION...

Pressing **B** on the UTILITIES menu will display the PACKEMUP menu.

PACKEMUP is a utility package (three programs) that will allow you to consolidate as many protected programs on a single disk as the disk storage will allow. The number of programs a single disk will accept depends on how large the individual programs are. It could be as few as one (which eliminates the need for PACKEMUP) to as many as 15 (which isn't too likely). By that, a maximum of 15 programs can be put on one packed disk.

With PACKEMUP you can give your packed disk a title which is displayed when the disk is booted and you can give each program on the disk a name of your choosing. In each case, you are allowed up to 23 character names. Throughout PACKEMUP, when you're prompted to input a name, there will be a guide line to prevent you from exceeding the 23 character maximum.

The only type of program that can't be packed with others is one that accesses the PROGRAM disk during the operation of the program (e.g. graphics adventures that continually access the disk for different screens). This doesn't include disks that boot a title, have you press a key, then loads the rest of the program. This type of program can be packed with others on one disk.

Trial and error can produce favorable results with programs that you wouldn't think could be packed. For example, you could pack a few different word processors on one disk so long as each program's data files are kept on a separate disk. The trick to this is to boot the packed disk with the word processor programs, select the particular program you want to work with, loading it into RAM, then re-power the drive (turn off, turn on) before using it for the data files disk. You might even be able to utilize the extra storage capability of 810T by storing the data files on a double density disk, so long as the program is double density compatible. The way to tell if a program is double density compatible is to simply try it out. Run a sample data file disk in double density with a few access conditions and see if it works. The time invested in research would be well spent if you end up with double density data file storage.

=====

PACKEMUP

=====

PACKEMUP PROCEDURE...

PACKEMUP is not an individual program in itself. It is three programs and all three are necessary to develop a packed disk.

The first function is to initialize a TO disk that is to be packed with the initialization program (A on the PACKEMUP menu, page J-3). A standard formatted disk will not do the job. It has to be formatted and initialized with this portion of PACKEMUP

The second function is mapping the FROM disk that is to be transferred to the packed (TO) disk (B on the PACKEMUP menu, page J-4). This reads the disk that is being transferred to find out how many tracks it uses and how many tracks of storage are necessary on the packed disk. The main reason for this function is to see if there are enough free tracks on the packed disk to accommodate the transfer. It also sets up a 'map' of what tracks have to be read (they may not be consecutive) and where to put them on the packed disk (if there's already a program on the packed disk, the new transfer may have to start writing on track 11, etc.)

The third function is the actual transferring of the FROM disk to the packed disk (C on the PACKEMUP menu, page J-5).

As you read about PACKEMUP and as the menu and instructions appear on the screen, remember the TO (destination) disk that will hold all the programs is referred to as the PACK or PACKED disk.

INITIALIZE PACK DISK...

With the UTILITIES disk in the 810T, press **A** on the PACKEMUP menu to load the initializing program.

The first thing you'll see is the prompt 'Enter disk title:'. The line that is under the prompt is the guide to how long the title can be. It can be up to 23 characters long, can include spaces, upper and lower case alpha and any combination of alpha, numeric, symbols, and control characters. You're really just typing in a string. Just enter the title you want and hit <RETURN>.

If you aren't concerned about disk titles, just hit <RETURN> and the disk title will be the default 'PROGRAM MENU:'.

The next prompt will be 'Initialize this PACK disk?'. Entering any key except 'Y' will default to No and return you to the first prompt for the disk title. Pressing 'Y' is necessary to continue the initialization process.

The next prompt is to 'Insert a blank disk' and 'Press any key to continue'. Do just that. Insert a blank disk and hit a key. The disk you insert does not have to be formatted. When you press a key, the disk will be formatted and initialized.

When the initialization process is finished, the screen clears and the first prompt for the disk title will re-appear. If you wish, you may initialize any number of disks and title them before going on to the mapping operation.

If it has trouble formatting the disk, the drive will ERROR out and you'll get the ERROR message 'Format ERROR! Press any key to restart'. It's probably a bad disk. Insert another disk and press a key to return you to the disk title prompt.

If the disk seemed to format okay and it ERRORS out while initializing, you'll get a 'Disk write ERROR! Press any key to restart'. It may not have formatted properly. Press a key to return you to the disk title prompt.

Pressing <BREAK> at the disk title prompt will return you to the UTILITIES main menu (if the UTILITIES disk is still in the drive).

From the UTILITIES menu you can press **B** to bring the PACKEMUP menu back and get on to mapping the source disk.

MAP DISK TO PACK...

With the UTILITIES disk in the 810T, press **B** on the PACKEMUP menu to load the disk mapping program.

This part of PACKEMUP can be confusing. Read carefully.

When you press **B** on the PACKEMUP menu, the disk mapping program will be loaded and you'll see the prompt 'Insert disk to MAP, reboot console'

While that prompt is on the screen and before you make the next move, the 810T motor will alternately turn on and off and the busy light will blink. It will continue to do so until you reboot the console.

Do what the prompt says. Just insert the FROM (source) disk you want transferred in the 810T, turn the console off, then turn the console back on again.

You are simply loading the game, utility, or whatever disk you want to transfer. **IMPORTANT:** Load it all the way and fire the first shot or make the first input or whatever. **BE CERTAIN** the program is completely loaded before you make the next move. **JUST DON'T TURN THE DISK DRIVE OFF.**

When the FROM (source) disk is completely loaded, turn off the console, insert the UTILITIES disk into the 810T and boot it up.

You'll get the UTILITIES main menu and you're ready to press **B** to bring the PACKEMUP menu back and get on to the actual transferring of the disk.

PACK DISK...

With the UTILITIES disk in the 810T, press C on the PACKEMUP menu to load the disk packing program.

The PACK DISK menu will appear giving you four choices:

PACK disk directory - Pressing A clears the screen and brings the prompt to 'Insert a PACK disk, press <START>'.

When you insert a PACK disk and press <START>, the screen will show the disk title (top line), and a directory of the programs on the disk. The last line in the directory section will show the 'Free tracks remaining'. Since 1 track is needed for the directory, a newly initialized disk with no files will show 39 'Free tracks remaining'. You'll notice that on all packed disk directories, the tracks, used and free, will always add up to 39.

The instruction area will prompt you to press <START>. Doing so will return you to the PACK DISK menu.

Delete PACKed file - Pressing B clears the screen and brings the prompt to 'Insert a PACK disk, press <START>'.

Insert the disk from which you wish to delete the file and press <START>. You'll see the disk title and a directory of the files on the disk. The instruction area will show 'Delete PACK file:' and prompt you to enter 'File name?'. You CANNOT use wild card combinations. You must type an individual file name.

Enter the file name you wish to delete and press <RETURN>.

You will then get a second chance to make a decision. Once you've entered the file name to delete and pressed <RETURN>, the screen will clear and the menu files will start to appear. When the menu listing gets to the file you entered it will stop listing and the prompt <Y/N> will appear at the end of the that file line. If you want to delete, press 'Y'. Pressing 'N' continues the file listing. This way, if you have two files with the same name, you can select which one to delete.

If you type a wrong name and press <RETURN>, the same clear screen, list menu process will take place but the listing won't stop anywhere with the <Y/N> prompt. It will just list the whole menu and prompt you with 'File name?', waiting for another input.

PACK DISK... (cont)

Still working from the PACK DISK menu:

PACK disk - Pressing C clears the screen and brings the prompt to 'Insert PACK (TO) disk in drive 1, press <START>'.

The default drive number for both the FROM (source) and TO (destination/PACK) disk is 1. To change these parameters, you have to use the next function (D) on the PACK MENU.

Insert the FROM (source) disk in the 810T and press <START>.

You'll see the disk title and a directory of files on the disk with the bottom line of the directory showing the Free tracks remaining. The instruction area will show 'Tracks needed for file:' with the number of tracks needed for packing the last program you mapped onto the PACK disk.

If the number of tracks remaining on the PACK disk is not sufficient to store the FROM disk, the message will state 'Disk too full for this file' with the prompt to 'Try another PACK disk' and 'Press <START>'. Pressing <START> will take you back to the PACK DISK menu.

If there are enough free tracks on the PACK disk, the prompt 'Use this PACK disk? <Y/N>' will appear. Pressing 'N' takes you back to the PACK DISK menu.

Pressing 'Y' brings the prompt to enter the file name. Type in the file name and press <RETURN> to set. If you type a name 23 characters long, the 23rd character input will cause the computer to automatically set the name and go onto the next prompt.

Once the name is set, you get another chance to accept it. The file name will appear right above the bottom instruction line, and the instruction prompt will ask 'OK to PACK using above name? <Y/N>'. Pressing 'N' returns you to the PACK DISK menu. Pressing 'Y' begins the PACKing process.

The PACKing process display on the screen and the disk swapping procedure (if using one drive) is the same as the display and the procedure with the BACKEMUP process (page I-3).

(continued next page...)

=====

PACKEMUP

=====

PACK DISK... (cont)

The new file name is not written to the PACK DISK directory nor are the tracks for the new file allocated until the PACKing process is complete. Therefore, if you wish to abort the process (pushing <SYSTEM RESET>) during the operation, the PACK disk will be in the same state with the same number of free tracks as when the packing process began.

Reset TO & FROM disks - Pressing D clears the screen and shows the default parameters as Drive 1 for both the FROM disk and the TO disk. It assumes a one drive operation.

The prompt in the instruction section gives you a choice of pressing <START> to accept the parameters shown or pressing <SELECT> if you want to change parameters.

If you press <SELECT>, the cursor will appear on the FROM drive number and the instruction area will prompt you to input a number from 1 to 4. Input the number, then press <RETURN> to set it and the cursor will move to the TO drive number. If you press <RETURN> without inputing a number, the drive number shown will remain the same and the cursor will move to the next input location.

After inputing your choice of the TO drive number and/or pressing <RETURN>, the original prompt of <SELECT> or <START> will re-appear in the instruction area.

Pressing <START> will return you to the PACK DISK menu.



CHECKING YOUR DISK SPEED...

Pressing C on the UTILITIES menu will load the REVCHECK program. Once the program is loaded, the screen will be blank for 5 seconds while it loads some data.

The only prompt on the program is for the drive number you wish to check. It will check the speed of any drive number (1-4).

Two unique features of REVCHECK over other RPM programs are the accuracy (within 1 RPM under optimum conditions) and the continual reporting of the disk speed. As opposed to a single AVERAGE RPM report, REVCHECK gives 240 ACTUAL RPM reports per per minute (just over four times per second). This way, you can observe any fluctuation in drive speed during operation.

Every Atari 810 disk drive in captivity will fluctuate during operation. Some do so rarely, others are practically terminal.

If the pointer remains pretty much at 288 (center dot) you have a great drive on your hands.

If the pointer moves off the center dot and shows 286, 287, 289, or 290 RPMs the pointer will change color. Your drive operating at any of these speeds is acceptable.

If the speed remains constant at less than 286 RPM's or more than 290 RPM's the whole screen changes color and you should adjust your speed (page A-16).

If, during operation, the speed fluctuates between RPMs, that's okay, so long as the RPMs remain within the center small bar (286 to 290 RPMs). If it fluctuates beyond that area, some adjustment to your drive, other than just the speed, is definitely necessary. Turn to page B-5.

Two conditions are optimum when using REVCHECK. First, test the drive when it's warmed up (been used for a few minutes) and second, insert a used disk for the test and not a new one. Just insert any disk before you input the drive number or change disks during operation.

Just press <SYSTEM RESET> to return to the main UTILITIES menu (if the UTILITIES disk is in the drive).



RECONFIGURE INSTRUCTION OPTIONS...

Pressing D on the UTILITIES menu will load the RECONFIGURE program. This program will only reconfigure 810 TURBO drives.

The RECONFIGURE menu will display five default parameters that you can control and an instruction area. The instructions will be explained first for simplicity of learning about this powerful utility.

From the RECONFIGURE menu instruction area (bottom of screen):

Accept above parameters - Pressing 'A' will set the parameters listed in the menu for the specified drive, whether default or re-set by you, and return you to the main UTILITIES menu.

Change above parameters - Pressing 'C' will change the instructions and move the cursor to the first parameter shown (Drive to reconfigure) and wait for your input. Pressing <RETURN> without an input leaves the displayed parameter unchanged and the cursor moves to the next parameter for input. If parameter change is input, press <RETURN> to set the input and move the cursor to the next parameter. Once the last parameter is set (Op/Mode), the original instructions will again display waiting for input. You can then accept the changes or press 'C' to change them again.

restore Default parameters - Pressing 'D' will restore the default parameters and the cursor will return to the instruction area waiting for input.

abort reconfiguration - Pressing the <BREAK> key will abort the reconfigure process and return you to the main UTILITIES menu. The parameters last set prior to the abort till remain in effect.

The next page will explain the parameter changes.

810 TURBO

RECONFIGURE

CHANGING THE 810T PARAMETERS...

Any parameter changes made through RECONFIGURE are in effect for the drive specified until that drive is turned off. When turned on again, the parameters will be in default condition. Reconfigure parameter changes are NOT permanent.

Any parameter change that requires a numerical input can be input with decimal number or hex representation. If you use hex, remember to use the '\$' as the first input (\$2A for example). Regardless of which you input, the screen will always display the decimal equivalent when the number is set.

Pressing **C** (Change parameters) from the RECONFIGURE menu instruction area will change the instructions and place the cursor on the first parameter (Drive to reconfigure) waiting for an input.

At all parameter positions, pressing <RETURN> without a change input will set the existing displayed parameter and move the cursor on to the next parameter for input.

Drive to reconfigure - Input any drive number (1-4) and press <RETURN> to set. Pressing an invalid number or character(s) will set the drive number to the previously displayed number.

Motor timeout (.1sec) - The motor timeout is the length of time the 810T motor (busy light) stays on after the last disk access. You can input any number from 0 to 255, representing tenths of a second.

The standard timeout on the vanilla 810 is 7 seconds. The 810 TURBO default timeout has been set at 4 seconds (40 * .1) - why spend all that time waiting! Timeout under 1/2 second (5 * .1) for normal use is not recommended. Advanced programmers will recognize the advantage of timeout availability under 1/2 second and when it's safe to set such timeout.

Input a valid number and press <RETURN>.

Just remember, whatever number you input, the timeout, in seconds, is 1/10 of that number (100 = 10 seconds, 10 = 1 second, 72 = 7.2 seconds, etc.). You can play with this one so long as you remain within the recommended timeouts (5-255). You can't hurt anything SO LONG AS THE HEAD STEP RATE (next parameter) HASN'T BEEN CHANGED.

RECONFIGURE

CHANGING THE 810T PARAMETERS... (cont)

Head step rate (64ms) - The Head step rate is the amount of time it takes the read/write head to travel from one track to the next consecutive track on the disk. This feature is included in the UTILITIES strictly for use with any disk drive mechanism OTHER than the mechanism that came with your 810 and for very advanced programmers who are thoroughly familiar with the workings of the 810. If you want to play with it, you can input a number lower than the default number of 82 and you might notice your drive working a bit quieter. For operation reliability, DO NOT input a number lower than 64. Play with this feature ONLY with programs that are backed up or not that important.

Input a valid number and press <RETURN> to set.

OUR STRONGEST RECOMMENDATION IS THAT YOU DON'T MESS WITH THE HEAD STEP RATE AT ALL IF YOU DON'T QUALIFY AS A VERY ADVANCED PROGRAMMER!

For advanced programmers, your input must be multiplied by 64 to give you the number of microseconds the step rate will be. Each unit input is equivalent to 64 microseconds or .00064 seconds (default 82 * .00064 = .05248 seconds).

No. of retries on ERROR - When it runs into an ERROR, this is the number of times the drive tries to perform an operation before it gives up. You've heard your 810 crank a few times on some things before it quit trying. Those were ERROR retries. The default number of retries is 3. If the 3rd attempt fails, the drive will surrender. This utility can possibly help you recover a disk or program that seems blown due to an ERROR situation. Drives have been known to recover from these situations on the 7th or 8th retry. Just jack the number up a few and have another go at it. Although it won't hurt anything to input a high number, you really shouldn't go for more than 10 retries. If the operation isn't successful by then, it's pretty much a goner!

Input a valid number and press <RETURN> to set.

810 TURBO

RECONFIGURE

CHANGING THE 810T PARAMETERS... (cont)

Wr/Prot: Enable/Disable: - This interesting utility is here to put an end, forever, to cutting another notch in your disks so you can use the other side. By disabling the Write Protect feature on the disk drive you can write to a disk that is write protected or unnotched. This can be a money saver.

Even though a disk is certified for only one side, better than 95% of them can be written to the other side. THIS IS NOT RECOMMENDED, HOWEVER, TO BE USED FOR IMPORTANT FILES. As we stated before, the best disk insurance you can have for the important stuff, single or double density, is a disk that is certified Double Density Double Sided. Of course, if you make backups of everything, you can go against recommendations.

Pressing 'D' will toggle the Write Protect to the Disabled. Pressing any other key will toggle it to Enable (default). Press <RETURN> to set the desired parameter.

WARNING BE VERY CAREFUL WITH THIS FEATURE. REMEMBER THAT THE WRITE PROTECT WILL REMAIN DISABLED UNTIL THE DRIVE IS TURNED OFF OR RECONFIGURED BACK TO ENABLE. IT'S VERY EASY TO FORGET THAT IT'S DISABLED. USE THIS FEATURE WITH CAUTION!

Op/Mode: Vanilla/Turbo - Although your 810T will basically act like a vanilla 810 when you boot up your normal disks, it really isn't in a vanilla operating mode. This parameter allows you to put it in a vanilla mode so far as any of the firmware in the ROM is concerned. In essence, it disables the ROM functions that are not implemented in a standard 810.

This could help boot up certain software that may not work on the 810T. If that software recognizes the difference in the 810T floppy controller over the vanilla floppy, it may still not boot. That cannot be controlled. If a piece of software won't boot, try it with the 810T in the vanilla mode.

Pressing 'V' will toggle the Operating Mode to Vanilla. Pressing any other key will toggle it to Turbo (default). Press <RETURN> to set the desired parameter.

RUNNING DIAGNOSTICS...

Pressing **E** on the UTILITIES menu will load the DIAGNOSTICS program. This program will only diagnose the 810 TURBO disk drive. It will NOT diagnose any part of the console or any other peripheral in your system.

You are first prompted for the drive number you want to diagnose. You can leave the UTILITIES disk in the drive at this point or insert a BLANK disk. We suggest you get into the habit of inserting a BLANK disk. Just press any valid number (1-4) and the next prompt will appear.

It will then prompt you to select a Single pass test or Continuous test. Input an 'S' or a 'C' and the testing will begin.

As long as your 810T is under warranty, there isn't any need for you to know how to take care of any serious problem with the board. This utility is included to help US understand any serious problem that might come up.

A Single test will test the various areas of the drive only once and the program will end. The Write Protect sensor is tested during a Single test where it isn't during a Continuous due to the method of testing.

A Continuous will test everything except the Write Protect sensor over and over until the test is aborted.

When it tests for single and double density it formats the disk (single one way and double the other). You might want to take into consideration the wear and tear on the head if you decide to run a Continuous test. If your drive passes 20 Continuous tests, it's healthy as a horse. If it's going to fail, it will probably do so before the 10th attempt.

During the Single test, when you get to the Write Protect diagnose, you'll be prompted to remove the UTILITIES disk for the test to continue. Just open the door and take it out of the 810T.

(continued next page...)

=====
DIAGNOSTICS
=====RUNNING DIAGNOSTICS... (cont)

Next, you'll be prompted to insert a BLANK disk for the single and double density test. BE CERTAIN TO INSERT A BLANK DISK BACK INTO THE 810T FOR THE SINGLE AND DOUBLE DENSITY DIAGNOSE. Remember, it's going to try to format that disk. That's why it's best to insert the BLANK disk as soon as the program is loaded. Once DIAGNOSTIC is loaded into RAM, you don't need the UTILITIES disk in the 810T anymore.

Here's where the DIAGNOSTIC feature helps you at home. If the very first diagnose you attempt fails (right after installing your 810T) there is a 90% chance that you have an incompatible CPU chip and you can handle that one yourself. See page B-2.

If the first attempt passes and then fails later, any number of things could have happened. Call us and we'll see what can be done about it.

Pressing <RETURN> to exit at the first prompt will return you to the UTILITIES menu if the UTILITIES disk is in the 810T.

Pressing the <BREAK> key at anytime during the test will return you to the UTILITIES menu if the UTILITIES disk is in the 810T.

NOTICE: DON'T ATTEMPT ANY REPAIRS YOURSELF OTHER THAN THOSE MENTIONED IN THE TROUBLE-SHOOTING SECTION OF THIS MANUAL. IF YOU REMOVE THE WRONG CHIP FROM YOUR 810T BOARD WITHOUT THE AUTHORIZATION OF NCT, IT WILL VOID YOUR WARRANTY.



These four dot labels (F,R,2,3) are for identification of connectors (Page A-5) and IC chips (Page A-8) in the 810T board installation.

